# CONTENTS


| TRADE NAME | MODEL | FOLDER NO. |
|---|---|---|
| **TELEVISION COURSE—INSTALLMENT No. 9** | | |
| Aircastle | 5008, 5009 | 4816-1 |
| Aircastle | 5035 | 4816-2 |
| Airline | 84WG-2721A, 84WG-2721B | 4816-3 |
| Bendix | 1217D | 4816-5 |
| Browning | RV-10, RV-11 | 4816-6 |
| Clarion | 13101 | 4816-7 |
| Concord | 1-611 | 4816-8 |
| Coronado | 43-6485 | 4816-9 |
| Emerson | 571, 606 (Ch. 120066) Television Receiver | 4816-25 |
| Ford | M-1 (8A-18805A) | 4816-4 |
| Gilfillan | 68B-D | 4816-10 |
| Gilfillan | 68F | 4816-11 |
| Hallicrafters | S-47 | 4816-12 |
| Knight | 8D-340 | 4816-13 |
| Magnavox | Chassis CR190A, CR190B | 4816-14 |
| Masco | MAP-120N | 4816-15 |
| Motorola | 8FDT, 8GMT, BK8, BK8X, CT8, FD8, HN8, KR8, NH8, OE2, OE8, PC2, PC8, SR6, SR8 (Ch. 8A) | 4816-16 |
| Operadio | 1A140 | 4816-17 |
| Packard-Bell | 673A, 673B, 880, 880A | 4816-18 |
| Packard-Bell | 1273 | 4816-19 |
| RCA (Victor) | 8BX5 (Ch. RC-1059) | 4816-20 |
| Scott | Music Control (Dynamic Noise Suppressor) | 4816-21 |
| Sentinel | 296B, 296M | 4816-22 |
| Silvertone | 8168 (Ch. 109.638) | 4816-23 |
| Truetone | D1840 (Fact. No. 138PCXM) | 4816-24 |

# The PHOTOFACT Servicer

SEPT. 15, 1948 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ VOL. 5, No. 46

ROBERT M. ELLIS, *Editor*

## FIRST TELEVISION PHOTOFACT FOLDER IN THIS ISSUE!

There's a big bonus for you in this PHOTOFACT Folder Set! It contains our first Television Folder—on the Emerson 571 TV Set. This Folder marks a real milestone in the progress of servicing. It's important for your future—and here's why.

As a PHOTOFACT subscriber you know that the fundamental purpose of a PHOTOFACT Folder is to provide you with all necessary information to do a repair, quickly and easily. A second requirement is that the information should be presented in a *uniform* manner for all makes of equipment. Such uniform data is of special value to the independent service shop which must work with equal ease on all makes of sets. To save your valuable time (and time is the stuff that counts in radio servicing) we have made every effort to cut out all unnecessary padding or definitely repetitious data. You should not have to pay for material you already know or do not need. Information should be 100% useful and practical—easy to find, easy to apply. And that's the kind of useful data we give you in PHOTOFACTS.

When we organized our operation for producing PHOTOFACT Folders covering radio receivers, we knew pretty well at the start how they should be set up, because the founders of our company—the starting nucleus—had a 100% radio background, going back to the first days of radio—to spark and wireless in many instances. And all of us were soaked in the problems of the radio service technician.

When television "broke" as a nation-wide commercial development, we immediately determined to apply the PHOTOFACT method to television receivers. But how? What constituted the essential information? What was the proper presentation? The answer had to be *practical*—it could not be attained by digesting text books or manufacturers' service manuals. There was only one place where we could get our answer—and that was right at the work-bench. We had to find out at first-hand what data was required to service television equipment properly and easily.

Fortunately, we have in operation as a proving-ground for our activities a top-notch radio clinic, where practical radio receiver repair is carried out. Into the clinic we placed many standard makes of television receivers. From the roof-top arose a successive number of monstrous-looking antennas; for we were compelled to depend on the distant points of Cincinnati and Chicago for signals. These signals are weak, but surprisingly good results have been obtained. In a way, this dependency on weak signals has been a blessing in disguise, because a television receiver must be really "on the nose" to get a satisfactory picture. Practical alignment, adjustment, installation and repair problems have come to us a plenty. We also had the privilege of working with several television receiver makers in preparing their service manuals (the preparation of manufacturers' service manuals is an important part of our business). From all of this practical, real-life activity, the plan for the presentation of specialized Television PHOTOFACT Folders has come to life.

We had to find new techniques for analyzing TV sets. We had to set up separate lines with special new methods for digging out the essential TV servicing data you need. After months of research, and experience, we finally developed the uniform pattern for PHOTOFACT Television Folders.

The first PHOTOFACT Television Folder is in this issue. Take a few minutes to examine it carefully. Look especially at these outstanding features:

Your Folder is in a special envelope, punched to fit a standard binder. Individual pages or the entire contents are removable without disturbing the binder. We found it impractical to anchor large spreads; even with careful handling, the result was the invariable tearing of the page at the ring holes, and the disfigurement of the page. Television schematics must be *BIG* if they are to be clear; and we found there isn't room enough on a work-bench for both the television receiver chassis *and* the schematic. Such a schematic is about as handy as a bed sheet, and when hooked on to a ten or fifteen-pound book presents a real problem. This problem we believe is solved to a "T" by our open-edge envelope, which permits instant removal of the schematic and its attachment to an easel or to the wall back of your bench, where it will stay clean and out of the reach of your hot soldering iron, and where it is easy to read.

On the envelope is a reproduction of a cabinet photograph of the receiver to give you the same identification advantages you get from the cabinet shots of radio receivers. If you keep your PHOTOFACT Folders in a file cabinet, the open-edged envelope makes a splendid filing folder. And here is a *plus* feature that will make the busy repairman jump with joy. There is no electrical data printed on the back of the schematic likely to be required when you are using the schematic. In other words, when you arrive at the point in your service procedure where you need the schematic you will not have to turn it over repeatedly for data that is on the back side.

This same "no turn-over" make-up or format is used on the alignment procedure pages unless found impractical because of the make-up of an individual set.

Incidentally, the largest "spread" or unfolded sheet size contemplated for Television PHOTOFACTS is 34" wide by 22" high. We mention this because you probably will wish to get a piece of masonite, thin ply-wood, beaver-board or similar product of somewhat greater size to hang back of your work-bench as a mounting easel. "Spring" paper clips obtainable from any stationery and some 5¢ and 10¢ stores are ideal for clipping the schematic or other pages to the easel.

Here are other exclusive PHOTOFACT features, firsts, which will make your work easier:

★ A table of contents on page 1 so you can locate any desired data immediately.

★ A block diagram of the receiver showing functions of units, and functions of individual tubes within the units.

★ A full-page tube placement chart showing you where every tube belongs.

★ A simplified "call-out" system. For example, in the enclosed Folder No. 25 on the Emerson 571 we use three identical bottom chassis views—one with "call-outs" for capacitors, one with "call-outs" for alignment points and inductors; and one for resistors and controls. The number of "call-out" points is limited to prevent confusion.

★ All tubes are identified as to function on the schematic.

★ Alignment wave forms are given.

★ Complete Voltage and Resistance Charts. Resistances of critical B+ circuits are shown, measured back to the designated voltage source (rather than B—). This permits *absolute* values to be shown rather than a variable value influenced by electrolytic capacitor leakage.

★ Complete disassembly instructions—plus data on how to set up the chassis on your bench for servicing. You will find this mechanical data invaluable, since it will help prevent tube breakage or chassis damage.

Last but not least is the PHOTOFACT Standard Notation schematic; and a standardized arrangement of receiver sections within the schematic. This will make easy and speed your understanding of the circuit.

There you are—a galaxy of features to help you—features which are only possible because we waited until we had *practical first hand experience to tell us what you needed to do a better job with less effort.* You can expect a whole succession of PHOTOFACT Television Folders on popular models, each prepared in uniform style—each containing 100% complete, useful, accurate data. You can always depend on PHOTOFACTS to give you the best in service information.

## FIELD EXPERIENCES

Here is your opportunity for passing practical service experiences to others for the benefit of all. For every service "Field Experience" published, we issue to the author a certificate that is good for one PHOTOFACT Folder Set. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Company, Inc.

★ ★

### PUSH BUTTON TUNING SYSTEM

**Post-War Motorola Car Receivers**

"Complaint: Repeat chattering on one or more buttons.

"The trouble may be caused by poor lead dressing on the push-button plug receptacle. Remove the chassis and insert the plug to full depth. It will be noted that the pins extend through the receptacle. On poorly dressed wiring, this may result in shorting connections, and causing several buttons to try to work together. Redress the leads and readjust the buttons in the normal manner."

Submitted by: Mr. Robert E. Miller, Bob's Radio Service,
3224 Thorn, San Diego, Calif.

★ ★

### FILING FIELD EXPERIENCES

"Here is a handy system for having quick reference to 'Field Experiences' that has worked out well in my shop.

"When a new PHOTOFACT Set arrives from my distributor, I immediately list the field experiences on their respective folders. For instance, in Servicer No. 21 there is a Field Experience on the Philco 46-1201, so on the margin of PHOTOFACT Folder 464-35 of Set 4, I place this notation 'See F. E. No. 21.' With this cross reference I can locate quickly all the Field Experiences on any model.

"After making the entries in the Folders, I file my "Servicers" numerically in the back of a 25¢ loose-leaf binder. In the front of the binder I keep the latest Cumulative Index. I also save the front of each envelope and punch holes in it to fit the binding rings of my notebook. I will save the fronts of the envelopes for Sets 41, 42, 43, and when I get Set 45 with the new Index I will place it in the binder in place of the envelope fronts. In this way my index is always up to date.

"For the benefit of those people who stand around and watch a radio man work on their set, I find it very impressive to pull out the Folder and show them the picture of their set."

Submitted by: John T. Scott, Scott Radio Sales & Service,
469 No. Highland, N. E., Atlanta, Georgia

★ ★

### DELCO R-1234

**Photofact 467-7, Set 7**

"Symptoms: Intermittent; signal and noise level drop to zero abruptly; a slight jar restores operation, another cuts it off again.

"Cause: Customer's instruction book, stapled to the loop cover. Often one of the staples, partially through one turn of the loop, severs the wire after a few bumps. Intermittency occurs when the staple completes the circuit, then opens it again. This has been found the case in several sets.

"Cure: Remove staple, and solder broken loop wire."

★

### MOTOROLA VT-71, SERIES D, E, AND F

**Photofact Pending**

"Symptoms: Raster too small vertically, normal horizontally; impossible to focus; vertical oscillator and amplifier tubes and components normal.

"Cause: Off-value resistor in the H. V. bleeder string feeding vertical sweep output plates. In one case a 2.2 megohm resistor in this string (whose total resistance should be in the order of 18 megohms) had risen in value to 32 megohms.

"Cure: Replace resistor."

Submitted by: Guy Slaughter, Royal Radio,
20 West 45th Avenue, Gary, Indiana

★ ★

### SILVERTONE WIRE RECORDER 7085 AND 7102

**Photofact 4720-27, Set 30**

"When the radio part plays, and when the phonograph and wire recorder play back but will not record, my service procedure is as follows:

"Check the 50A5 oscillator tube by substituting a new tube. If the set still does not record, check the voltage between pins number 2 and 3 on the recorder head, using an AC voltmeter. The meter should read between two and three volts with the recorder head in the circuit.

"If I find the potential below two volts, I remove the chassis and check the voltages at the socket of the 50A5. If they check reasonably close to the voltages listed in the chart in the PHOTOFACT Folder, I then remove condenser, PHOTOFACT Item 15. (It lays alongside of the soldering lug strip.) This is a 0.1 mfd. 400 volt unit. Replace this with a good 0.1 mfd. 600 volt unit. I have changed several of these condensers and I have found that the one removed would check correctly for capacity and leakage; but by substituting a new condenser the set would record normally.

"I may be wrong but I think the reason for this is that the condenser becomes leaky when the 40 kc signal is applied to it."

Submitted by: Mr. Clare E. Ernst,
4918 Laurene Street, Flint 5, Michigan

★ ★

### CROSLEY 46FA (Battery Operated)

**Photofact 475-5, Set 15**

"Complaint: Set inoperative. Excess bias on the output tube.

"The second IF transformer in this set is wound on an iron core which has a bolt in one end for mounting to the shield can. The primary insulation may break down causing a high resistance leak from B plus to the chassis. This increases current through bias resistor (part 27 on the diagram) and cuts off the output stage. Since a replacement part may not be readily available, we make satisfactory repair by using fiber insulating washer to mount the transformer in its can. When so insulated, the leakage to the core does not seem to affect operation.

"We have serviced four of these sets recently with this same trouble."

Submitted by: W. M. McDonald,
Abrams McDonald Home and Auto Store, Dadeville, Alabama

★ ★

### EMERSON PORTABLE 536A, 551A, 553A

**Photofact 4714-17, Set 24**

"Complaint: Low volume and distortion.

"Check the 3.3 megohm resistor, PHOTOFACT Item 29, in the screen grid circuit of the 1S5 detector tube. This A.F. screen dropping resistor had increased in value to about 50 megohms."

Submitted by: Mr. Aime E. Langevin,
15 Orange Street, Danielson, Connecticut

★ ★

### ZENITH AUTOMOBILE RECEIVERS

**8MF881, 8ML882Z, 8MM890, 6MH889**

"If the on-off switch or any of the push-buttons stick down and fail to return, the trouble can be corrected by putting a small drop of oil on each plunger. We have had several sets in our shop with this complaint."

Submitted by: Mr. Ed Cox,
Modern Radio Service, Garden City, Kansas

★ ★

### WEBSTER 70 RECORD CHANGER

**Photofact 4719, Set 29**

"I was recently called to service a newly-installed Webster 70 Changer, the complaint being that it would not trip.

"The trouble was caused by the presence of a piece of cardboard used to prevent movement of the rocker arm assembly during shipment. The packing instructions calling for the removal of this piece had not been followed."

Submitted by: John Lorbiecki,
10721 West Bobolink Ave., Milwaukee 13, Wisconsin

## PUBLICATION DATES

When will other sets of PHOTOFACT Folders be published?

| | |
|---|---|
| ***Volume 5—Set No. 47*** | **Oct. 15** |
| ***Volume 5—Set No. 48*** | **Oct. 15** |
| ***Volume 5—Set No. 49*** | **Nov. 15** |
| ***Volume 5—Set No. 50*** | **Nov. 15** |

*If you have been unable to get any issues of* PHOTOFACT *Folder Sets, send your order and money directly to us and we will see that you are supplied.*

VERTICAL PULSE SEPARATION. In the description of vertical scanning systems we have mentioned "integrating" networks for segregation of the long time vertical field pulses from the "sharp" horizontal line pulses. At this time we will consider the means of "sorting" these vertical "frame scanning" pulses from the composite scanning pulses and their use to control the timing of the vertical oscillator.

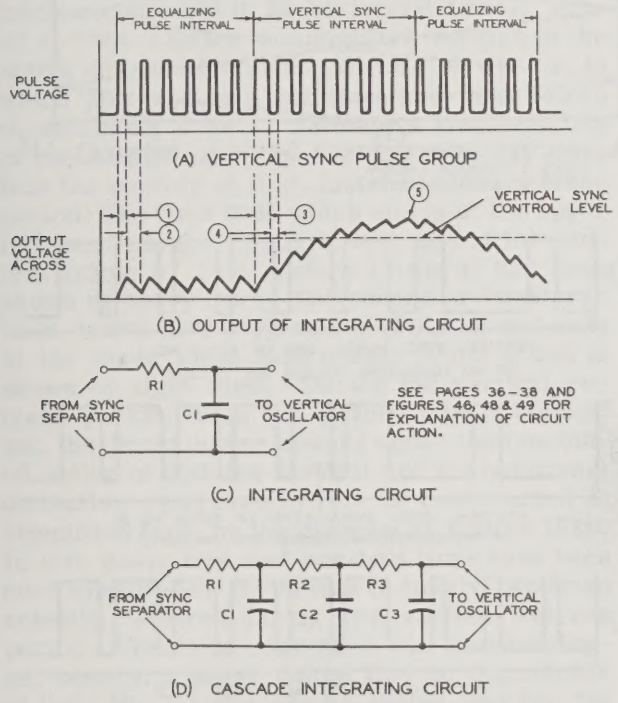



Fig. 101. Vertical Pulse Separation by "Integration"

The "integrating" action which is employed to "sort" the vertical pulses from the complex video signal is exactly opposite in nature to the "differentiation" process used for separation of the horizontal pulses. "Integration" is a mathematical term used in calculus and means the addition of a number of small elements or parts to form a whole. Figure 101 shows the circuit employed to accomplish this action, and it will be seen that it is exactly the reverse of the "differentiation" circuit of Figure 98. In this case, the resistor is in series with the input and the capacitor is connected across the output. The time constant of the combination is much longer than that employed for "sorting" the horizontal pulses. This time constant is made approximately equal to the duration of a horizontal pulse and consequently the charge accumulated by the capacitor, due to a horizontal pulse, is small and will decay rapidly. This action is shown in Figure 101B. During the time shown as (1) the equalizing pulses produce only a small voltage across the capacitor. This voltage decays to zero in the interval between pulses as shown at (2). The much longer vertical synchronizing pulses produce a greater charge in the capacitor during period (3). This charge does not completely decay during the short serration interval (4). Consequently, each of the vertical pulses adds an element of charge to the capacitor and the voltage continues to build up for the entire duration of the interval of vertical pulses. The dotted line shown on Figure 101B indicates the level at which this voltage becomes of sufficient amplitude to "trigger" the vertical scanning oscillator. In most designs, this point is made to occur after two or three of the vertical pulses have charged the capacitor.

In commercial television receivers, the vertical integrating network is seldom the two-element type shown in Figure 101C, but is usually a cascade network as shown in the example of Figure 101D. The resultant time constant of this network is smaller than that of any of the individual branches (R1-C1, R2-C2 or R3-C3). The value of the over-all time constant can be calculated in the same manner as used for the determination of the effect of resistors in parallel. For the three branch circuit of Figure 101D, using T1 for the time constant R1xC1, T2 for R2xC2 and T3 for R3xC3, the effective circuit time constant (T) will be $\frac{1}{T}=\frac{1}{T1}+\frac{1}{T2}+\frac{1}{T3}$. Typical values for the individual time constants for a three branch circuit such as that of Figure 101D, as found in modern receivers are from 30 to 60 microseconds. The effective over-all circuit time constants will therefore be between 10 and 20 microseconds.

The reasons for the use of cascaded integrating circuits are:

1. To prevent the erratic control of vertical retrace by random noise or static pulses. For such pulses to assume control of the vertical oscillator they would have to be comparable in duration and spacing to the vertical sync pulses.

2. To smooth out the contour of the rising voltage wave, shown in the interval 3 to 5 of



Copyright 1948. HOWARD W. SAMS & CO., INC. All Rights Reserved.

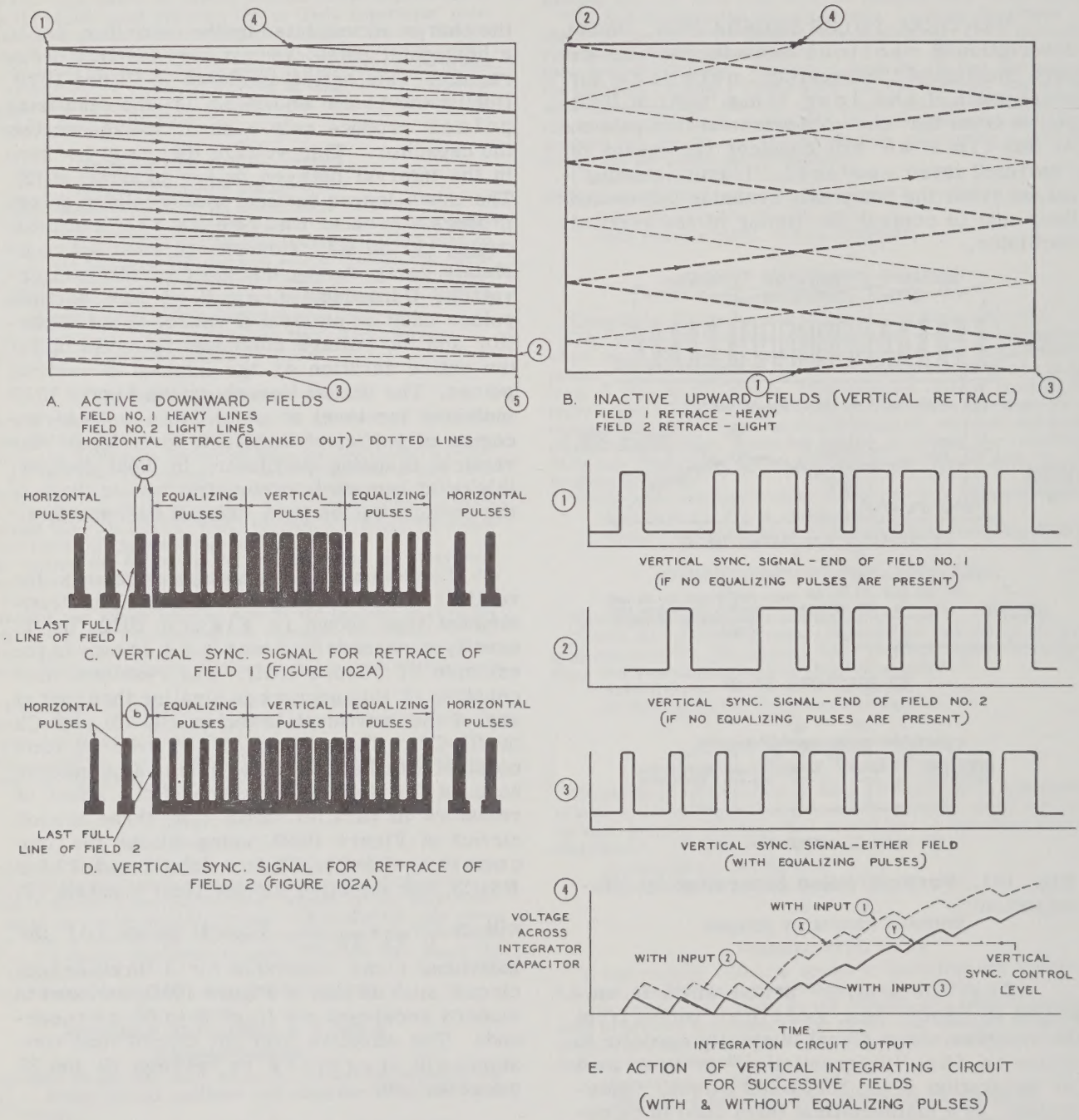

A. ACTIVE DOWNWARD FIELDS
FIELD NO. 1 HEAVY LINES
FIELD NO. 2 LIGHT LINES
HORIZONTAL RETRACE (BLANKED OUT) - DOTTED LINES
B. INACTIVE UPWARD FIELDS (VERTICAL RETRACE)
FIELD 1 RETRACE - HEAVY
FIELD 2 RETRACE - LIGHT
HORIZONTAL PULSES
EQUALIZING PULSES
VERTICAL PULSES
EQUALIZING PULSES
HORIZONTAL PULSES
LAST FULL LINE OF FIELD 1
C. VERTICAL SYNC. SIGNAL FOR RETRACE OF FIELD 1 (FIGURE 102A)
LAST FULL LINE OF FIELD 2
D. VERTICAL SYNC. SIGNAL FOR RETRACE OF FIELD 2 (FIGURE 102A)
VERTICAL SYNC. SIGNAL - END OF FIELD NO. 1
(IF NO EQUALIZING PULSES ARE PRESENT)
VERTICAL SYNC. SIGNAL - END OF FIELD NO. 2
(IF NO EQUALIZING PULSES ARE PRESENT)
VERTICAL SYNC. SIGNAL - EITHER FIELD
(WITH EQUALIZING PULSES)
VOLTAGE ACROSS INTEGRATOR CAPACITOR
WITH INPUT 1
WITH INPUT 2
WITH INPUT 3
VERTICAL SYNC. CONTROL LEVEL
TIME
INTEGRATION CIRCUIT OUTPUT
E. ACTION OF VERTICAL INTEGRATING CIRCUIT FOR SUCCESSIVE FIELDS
(WITH & WITHOUT EQUALIZING PULSES)

Fig. 102. Use of Equalizing Pulses to Assure Correctly Interlaced Vertical Scanning

Figure 101B, across the output capacitor. The action is similar to that of the familiar resistance-capacitance power supply filter system, in which the ripple is reduced by successive stages.

As a result of this smoothing action, an individual horizontal pulse cannot assume control at the instant of retrace and cause "pairing" of lines.

The sections of this cascade network are not usually made with equal time constants. This unbalance assists in rendering the system immune from accidental triggering by noise pulses.

The Function of Vertical Equalizing Pulses. On page 24, we discussed briefly the subject of interlaced scanning which is employed to prevent "flicker" of the image. For simplicity, the retrace which occurs from bottom to top of the picture was shown at that time as a straight line or single "jump". Actually, it is necessary to keep the horizontal oscillator running in exact step or synchronism with the transmitter during the vertical retrace period which lasts from 1250 to 1400 microseconds (20 to 22 horizontal lines). Figure 102A shows a simplified version of the active downward scanning of the picture in which nine and one-half lines have been drawn to represent a field. Actually a field consists of two hundred sixty-two and one-half lines less the number of lines lost during the retrace period. The first field which starts at the upper left hand corner (Point 1) and ends at the center bottom of the picture (Point 3) has been shown by heavy lines. The second or interlaced field, starts at the top center (Point 4) and ends at the lower right hand corner (Point 5) and is shown by light lines. During the vertical retrace period, when the picture tube is blanked out, the beam moves upward under the combined action of both the vertical and the horizontal deflection systems. This is represented in simplified form by the diagram of Figure 102B. In this case, five and one-half lines have been used to represent the twenty to twenty-two lines actually required during the vertical retrace period. The same convention has been employed, namely, a heavy dotted line for the retrace of field No. 1 and a light dotted line for the retrace of field No. 2.

The dual functions, of producing vertical retrace at the proper instant and of keeping the horizontal oscillator in synchronism, are controlled by the action of the groups of equalizing and vertical pulses shown in Figures 102C and 102D. It will be seen that the vertical sync signal for the retrace of field No. 1 differs from that of field No. 2 by the spacing between the last horizontal pulse and the first equalizing pulse. In Figure 102C, for field No. 1, this space (a) consists of only one-half of a horizontal line since field No. 1 ends at the middle of the last line as shown at Point 3 of Figure 102A. In the case of Figure 102D, for field No. 2, the space (b) between the last horizontal pulse and the first equalizing pulse consists of an entire horizontal line as shown at Point 5 of Figure 102A. Vertical blanking starts at the leading edge of the equalizing pulses and thus the successive field blanking time is accurately set up by the signal.

Even though blanking for the retrace period is accurately established, vertical retrace itself may not take place at the proper instant unless the critical charge on the integrating capacitor occurs at exactly the same point for each successive vertical sync signal. The manner in which the equalizing pulses assure this condition is shown in Figure 102E. At (1) is shown the composition of a vertical sync signal which would follow field No. 1 if the equalizing pulses were not present. This signal input to the integrating circuit would charge the capacitor as shown by the dotted line labeled (1) in curve (4). This curve crosses the sync control level at time (X). The set of conditions which would occur for the type of vertical signal, without equalizing pulses, for retrace at the end of field No. 2 is shown at (2) in Figure 102E. In this case, the critical sync control level is reached at point (Y) which is sufficiently later than point (X) so that proper interlace would not occur. When equalizing pulses are employed as shown at (3), the critical "firing" point for the vertical oscillator is seen to coincide with the condition shown at (2). Successive fields preceded by equalizing pulses will therefore produce accurate control of the oscillator and assure proper interlace.

ACTION OF THE HORIZONTAL DIFFERENTIATING CIRCUIT DURING THE VERTICAL PULSE PERIOD. The formation of positive and negative "pips" respectively at the leading and trailing edges of the vertical sync pulses was described briefly on page 95. We will now consider, in somewhat greater detail, the action of the horizontal differentiating circuit during the entire vertical pulse

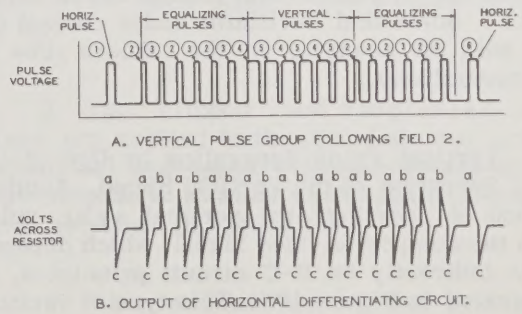



Fig. 103. Action of Horizontal Differentiation Circuits During Vertical Pulse Period

period. Figure 103A shows the configuration of the vertical signal which follows field No. 2.

The horizontal pulse which starts retrace of the bottom line of the picture is shown at (1) in Figure 103A and the positive output "pip" produced by its leading edge is shown at (a) in Figure 103B. The "pip" produced by the trailing edge of this same horizontal pulse, as well as those produced by the trailing edges of all of the other pulses of the period (labeled c), are rejected by the sync system as previously explained.

Each of the equalizing pulses (2, 3) which precede and follow the vertical pulse group also give rise to a pair of positive and negative pips as shown. Only the pips marked (a) are used for oscillator control. Those labeled (b) are rejected since they occur at a time in the scanning cycle at which the horizontal oscillator is not sensitive to pulse control (see Figure 68 and page 55).

Each of the pulses of the vertical group (4, 5) also produces a pair of positive and negative pips. In this case, only the positive pips ("a" of Figure 103B) are utilized.

The horizontal pulse shown as (6) is one of a group occurring during the blanking period. (See page 53.) The pips produced by it are identical to those produced by the horizontal pulse (1) of Figure 103.

It is evident that the vertical pulse group is able, by the action of the individual pulses and by the differences in length of these pulses, to perform the dual functions of assuring vertical retrace at the correct instant and of keeping the horizontal oscillator under control (in step with the scanning in the camera tube at the transmitter).

Vertical Pulse Separation by Use of the First Serration of the Vertical Signal. Another method of "sorting" the vertical sync pulse from the composite video signal, which depends only indirectly on R-C circuit principles, is illustrated in Figure 104. This type of vertical sync separation is not dependent, for accurate retrace and proper interlace, upon the existence of equalizing pulses.

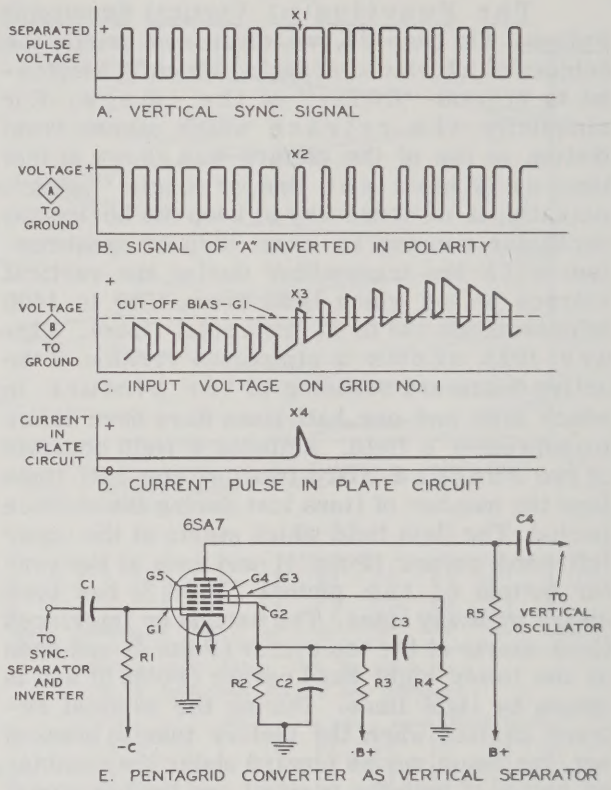



Fig. 104. Vertical Sync Pulse Separation Using First "Serration" of Vertical Signal for Scanning Control

The first "serration" of the vertical pulse group (X1 of Figure 104A) always occurs at the same instant of time, i. e.: one-half of a horizontal line after the beginning of the first vertical pulse. This first "serration" is separated from the "mixture" and used for control of the vertical scanning oscillator. In order to accomplish this result, it must be changed from a "negative going" pulse to a "positive going" pulse. This is done by passing the separated pulse group through an amplifier stage which inverts the phase or polarity (see Figure 104B).

The inverted signal is fed to Grid No. 1 of a pentagrid converter tube (6SA7), see Figure 104E, through a differentiating network (C1-R1). This circuit has a time constant of approximately one-half of the horizontal line scanning time or about 30 microseconds. This grid is biased negatively to such a value that the differentiated pulses, due to the equalizing pulse period, are not of sufficient amplitude to cause any flow of plate current (see Figure 104C).

When the inverted pulse arrives, due to the first serration of the vertical signal, (Point X3 of Figure 104C) it has developed sufficient voltage, across R1, to cause the grid to pass its cut-off bias and start a pulse of plate current.

Screen Grids Nos. 2 and 4 are connected together and are held at a low voltage by the high resistance divider network (R2, R3). Bypass capacitor C2 is of relatively small value and as Grid No. 1 is driven positive by pulse X3 the screen voltage drops rapidly.

The third grid, normally the input when the tube is acting as a converter, is coupled to the screens through capacitor C3. This grid will undergo the same voltage drop as the screens and will cut off the plate current as the screen voltage goes negative. Grid No. 3 is held beyond cut-off until the charge on capacitor C3 has "leaked" off through resistor R4. The time constant of C3-R4 is made sufficiently long to allow the rest of the vertical pulse group to pass before Grid No. 3 can regain control.

As the result of this action, only the first pulse which passes the cut-off bias of Grid No. 1 (Point X3) will cause any plate current. This plate current occurs as a single sharp "pip" pulse is coupled to the vertical scanning oscillator through capacitor C4.

SYNCHRONIZING SYSTEMS (METHODS OF UTILIZING THE SEPARATED SYNC PULSES): There are three general types of synchronizing systems in use in modern television receivers. They are classified as follows:

1. "Triggered" sync. This system depends upon the use of individual sync pulses to control the scanning of each horizontal line and the vertical retrace of each frame. The elements of this type of system have been covered in the preceding text and the circuit illustrations on pages 74 and 84.

2. "Flywheel" or A. F. C. sync. The A. F. C. system, which was described briefly on pages 75-76 and illustrated in Figure 83, depends upon the average of the synchronizing pulses and their rate of repetition rather than the individual pulses. A fully detailed description of the circuit operation will be presented in this chapter.

3. "Pulse width" controlled sync. In this method, the sync pulse is compared in timing with the output of the scanning oscillator and produces a narrow, augmented pulse for control of the instant of retrace. Its action has been covered on pages 83-84 and illustrated by Figure 90.

FLYWHEEL OR A.F.C. SYNC CONTROL. Figure 105 shows a typical circuit adaptation of the automatic frequency control of horizontal scanning by the sync pulses. More properly, it should be called "automatic phase control" since its action "locks" the phase, as well as the frequency, of the horizontal oscillator.

The operation of the circuit is as follows:

1. A very stable oscillator, tube T4 and its associated circuits, generates a sine wave of 15,750 cycles per second. This oscillator circuit is of the "hot cathode" Hartley type and its frequency determining components are inductance L3 and capacitance C2. The free running frequency is adjusted by the powdered iron core of inductor L3 with the hold control (R7) in mid-position.

2. A tapped coil circuit, L1-L2, is tightly coupled to L3 and tuned slightly "off resonance". The voltage across these coils is applied to a "discriminator" circuit similar to the type used for frequency modulation detection. The voltages, from the horizontal oscillator, which are applied to the plates of the discriminator tubes (T1 and T2) are equal in amplitude and opposite in phase (180° out of phase with each other). See Figure 106, (1) and (2).

3. The "clipped" and amplified sync pulses are applied to the discriminator across resistor R3 and appear "in phase" and of the same amplitude at each diode of the discriminator as shown in Figure 106.

4. Three conditions of the system in which the relation of the oscillator frequency to the sync pulse repetition rate is slow, correct, and fast are shown in Figures 106A,

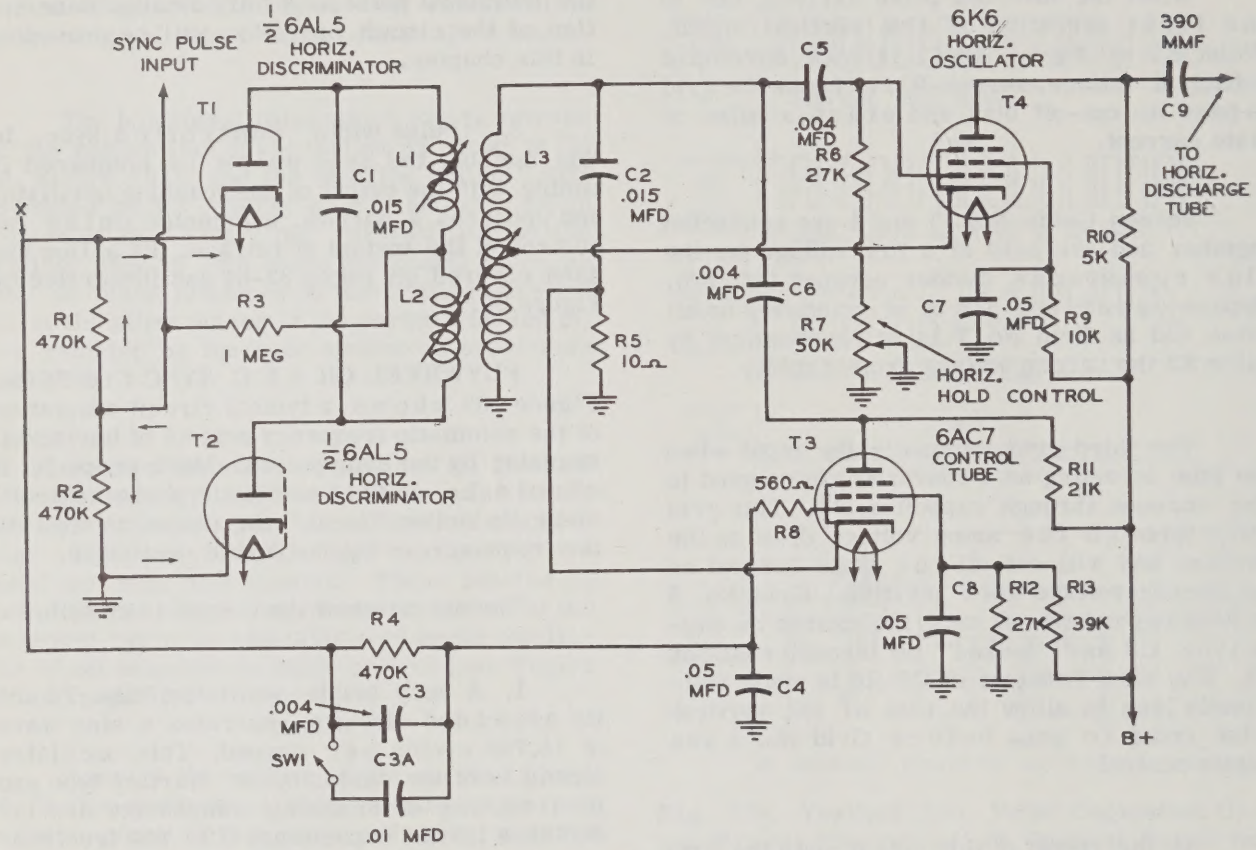



Fig. 105. "Flywheel" or A. F. C. Control of Horizontal Scanning Oscillator

106B, and 106C respectively. It will be noted that the diode load resistors R1 and R2 are so connected that the voltage from ground to point X is the difference between the rectified output of the diode, tubes T1 and T2. Arrows show the direction of electron flow due to the plate current of these tubes.

5. If tube T1 alone is conducting, point X will be positive with respect to ground and if tube T2 is conducting, with no current flow through tube T1, point X will be negative with respect to ground. In the absence of sync pulses, equal and opposite voltages appear across the diodes, tubes T1 and T2, and the total rectified voltage appearing between point X and ground is zero, over the cycle.

6. The condition of stable operation occurs with the sync pulses riding at zero phase, or on the axis of the wave as shown at (B) of Figure 106. In this case, the rectified output of the upper diode, tube T1, would produce a voltage across R1, as shown in Figure 106B (3). The lower diode, tube T2, would produce the voltage wave shown in Figure 106B (4). These voltages oppose each other due to the method of connection of the diodes to the series load resistors, R1 and R2. The net charge on the filter network, C3, R4, and C4; is zero, as shown in Figure 106B (5).

7. If the horizontal scanning oscillator is running faster than the repetition rate of the sync pulses (see Figure 106A), the upper diode output voltage will exceed that of the lower diode as shown at 106A (3). After smoothing through the filter network, a positive voltage will appear at the grid of reactance control tube (T3).

8. In a similar manner, if the oscillator is running slower than the repetition rate of the sync pulses, the set of conditions shown in Figure 106C will apply. In this case, a negative control voltage will appear at the grid of tube T3.

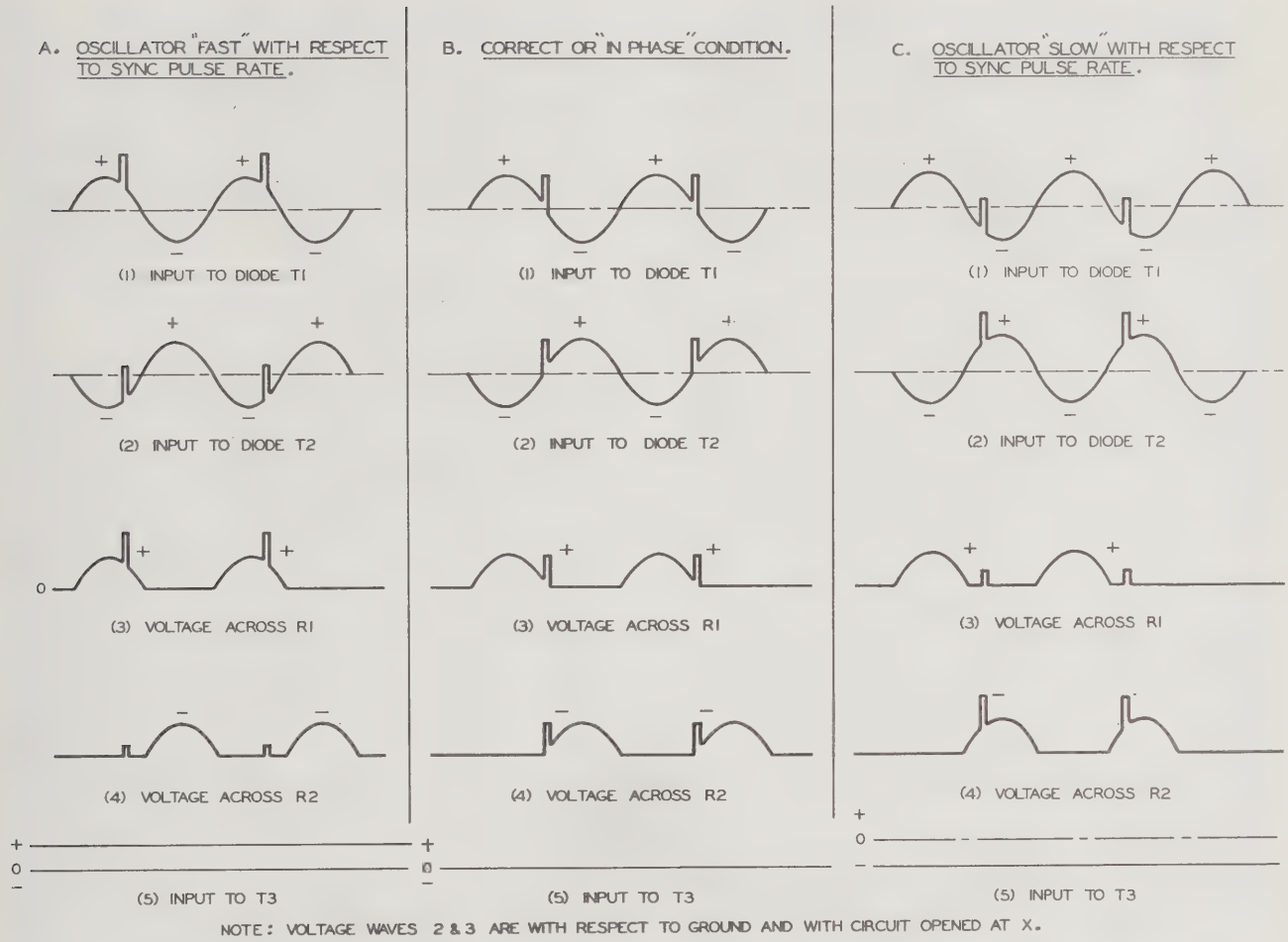

A. OSCILLATOR "FAST" WITH RESPECT TO SYNC PULSE RATE.
B. CORRECT OR "IN PHASE" CONDITION.
C. OSCILLATOR "SLOW" WITH RESPECT TO SYNC PULSE RATE.
(1) INPUT TO DIODE T1
(2) INPUT TO DIODE T2
(3) VOLTAGE ACROSS R1
(4) VOLTAGE ACROSS R2
(5) INPUT TO T3
NOTE: VOLTAGE WAVES 2 & 3 ARE WITH RESPECT TO GROUND AND WITH CIRCUIT OPENED AT X.

Fig. 106. Discriminator Action in Horizontal AFC Sync Control Circuit of Figure 105

9. The 6AC7 reactance control tube is connected across the oscillator "tank" inductance L3. The manner in which this tube can control the instantaneous frequency of the oscillator is as follows:

a. The plate current versus plate voltage curves of a high gain, sharp-cut-off pentode, such as the 6AC7, exhibit a long range of plate voltage over which there is substantially no change of plate current. This region is shown in Figure 107B. The plate current is under the control of the grid voltage as indicated by the individual curves of the plate current-plate voltage family.

b. Referring to Figure 107A, we find that the plate is connected to the high side of the oscillator tuned circuit through capacitor C2. The alternating voltage from the oscillator, appearing across the tube, is swinging over the flat portion of the curve and therefore no change of plate current occurs. If, on the other hand, an alternating voltage is applied between grid and cathode the plate current will be changed in amplitude, and this change will be in phase with the alternating grid voltage.

c. If the alternating voltages applied to the grid and plate are made 90° out of phase, the plate current will then have an alternating component which is 90° out of phase with the plate voltage, i. e. in phase with the grid voltage.

d. Any circuit in which the current flow-

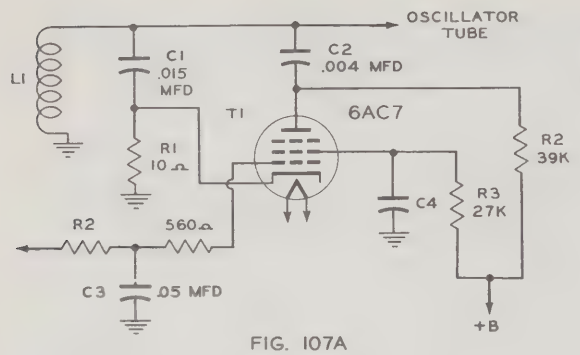



FIG. 107A

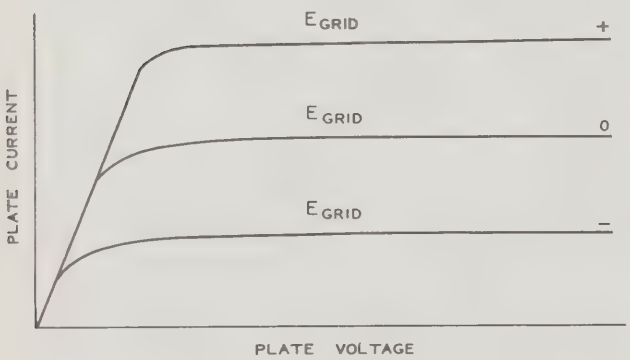



Fig. 107. Reactance Control Operation

ing is not in phase with the applied voltage is reactive. The circuit then appears to be capacitive or inductive. Thus, tube T1 of Figure 107A can be made to appear as a reactance connected across the oscillator inductance L1.

e. The phase shift of applied alternating grid voltage, with respect to the alternating plate voltage, is provided by the network C1-R1. The voltage across R1 is leading the voltage across the tank circuit by almost 90°. Since the reactance of the coupling capacitor C2 is low, the voltage applied between cathode and grid is approximately 90° out of phase with that applied between plate and ground.

f. The control grid is returned to ground, or to the end of R1 opposite the cathode, through capacitor C3. The reactance of C3 is very low at the oscillator frequency of 15,750 cycles. The DC return path of the control grid is through the output load resistors of the discriminator stage (R1 and R2 of Figure 105). Since the alternating grid voltage is applied between cathode and the grounded grid, rather than between grid and ground, the plate differs by 180° from the phase it would have if the cathode had been grounded and the grid voltage made variable. In this case, the plate current will lag the plate voltage and the tube will appear as an inductance to the tuned circuit.

g. The bias voltage on the grid of the reactance tube controls the value of its transconductance (ratio of change in plate current to the change in grid voltage which caused it). The alternating plate current amplitude can thus be changed by varying the bias on the control grid. A low or positive bias will result in an increase in the AC plate current while a more negative bias will reduce the value of AC plate current. Since the AC plate voltage is fixed by the output of the oscillator, a bias change will change the ratio of voltage to current and thus, the apparent value of inductance across the oscillator circuit.

10. If the frequency of the horizontal oscillator should shift with respect to the sync pulse rate, due to variation of supply voltage or other cause, a change of the DC output of the discriminator would occur. This changes the transconductance of the control tube, shifting the instantaneous oscillator frequency to restore the equilibrium condition of Figure 106B.

The network of resistors and capacitors, (R4, C3 or C3A, C4 and R8), which connect the output of the discriminator to the grid of the control tube T3 (Figure 105) requires explanation. The purpose of resistor R4 is to provide a DC return path for the grid of the control tube (T3). Resistor R8 acts as a parasitic suppressor to prevent any possible ultra-high frequency oscillation which might occur in the high mutual conductance type 6AC7 control tube.

Capacitor C3 and capacitor C4 constitute a voltage divider and a filter. The "ripple" on the rectified output of the discriminator diodes is smoothed to furnish a DC voltage to the control tube. Since the reactance of the smaller capacitor C3 (.004 mfd) is on the top side of

the divider, and the larger capacitor C4 (.05 mfd) on the bottom, extremely rapid voltage changes are prevented from affecting the grid voltage of the control tube. Rapid changes can be caused by bursts of noise or by the serrations of the vertical sync signal. These changes are rejected by the action of this voltage divider.

The ratio of the voltage divider consisting of C3 and C4 can be changed by "switching" capacitor C3A (.01 mfd) in parallel with C3. This link connection for the addition of C3A is provided to take care of a condition existing in some television transmitters. If any "phase" modulation of the exact position of the horizontal sync pulse occurs, it is necessary for the A. F. C. control tube to follow this modulation and a "faster" response circuit is required. This is provided by increasing the capacitance of C3 by the addition of C3A. The effect of the phase modulation of the horizontal pulses, if suppressed by the original capacitance ratio, would be to produce a horizontal displacement of part of the picture with respect to the raster.

The use of the higher capacitance, C3A, will result in some sacrifice of "immunity" of the system from horizontal "tearing" by noise. Transmitting technique is constantly improving and the service technician should re-check any installation in which it was originally necessary to employ the higher capacitance to determine whether the advantages of a "fast" circuit with its attendant noise immunity can be tolerated.

The A. F. C. type of sync system has been covered in detail because its use is becoming increasingly popular in television receiver design. The reasons for its popularity are: (1) its relative immunity from triggering by noise, (2) it can take advantage of the entire horizontal pulse time for the discriminator control, and (3) it allows the horizontal trace return time to be slower than could be tolerated with "triggered" sync operation. The reason for its immunity to the effects of static, man-made interference, and receiver input-circuit noise lies in the fact that the frequency distribution of such noise energy is approximately the same both above and below the sine wave oscillator frequency. Thus, the average DC contribution of the two discriminator diodes due to the noise tends to be equal and cancel at point "x" of Figure 105.

TYPICAL COMMERCIAL SYNC SYSTEMS. The circuits described and illustrated on pages 73 to 84 covered the sync-controlled scanning system from the point of separation of the pulses to the deflection of the electron beam in the picture tube. Means of separating the sync pulses from the complex video signal have been covered on pages 85 through 98. It has been shown that sync pulse separation can be accomplished at several places in the circuit between the video detector tube and the picture tube.

To illustrate the many points in the television receiver system at which the sync synchronizing pulses may be separated from the signal, a composite circuit is presented in

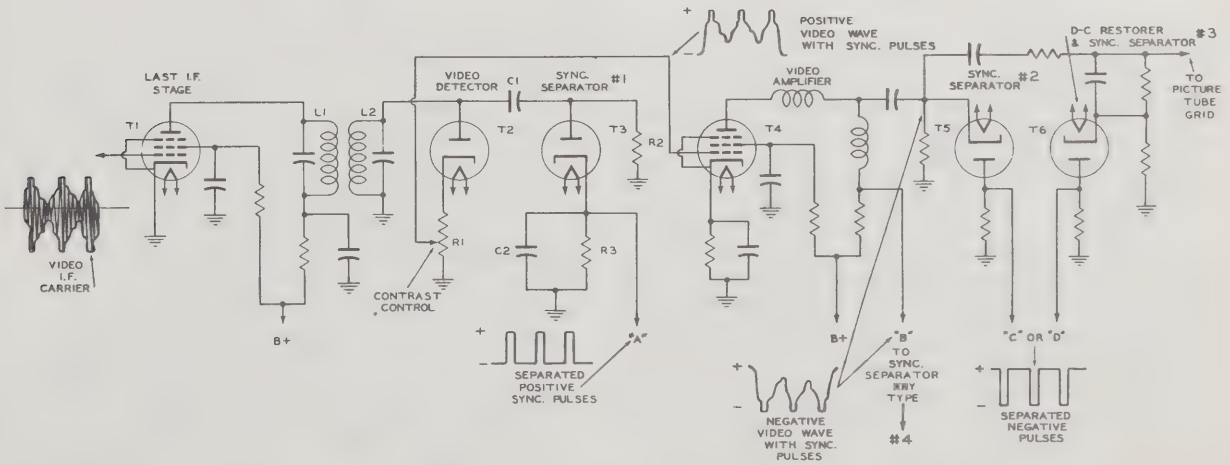



Fig. 108. Composite Circuit Showing Points at which Sync Pulses Might Be Separated

Figure 108. It should be understood that this circuit does not represent an actual or practical television system since extra tubes have been added to present the possible points of sync separation. Four possible positions of sync separation are shown at "A", "B", "C", and "D". The choice of any one of these points by the receiver designer is governed by the required polarity of the pulses and by the amount of signal energy required by the remainder of the sync system.

When a diode such as tube T3 is coupled directly to the output of the video I-F amplifier, illustrated by sync separator No. 1 of Figure 108, the pulses obtained across the cathode resistor R3 are positive with respect to ground. If sync separation is taken at this point, it is usually necessary to employ additional amplification to obtain a pulse of sufficient amplitude to control the horizontal and vertical scanning oscillators. Sync separation at the video I-F output has the advantage of being independent from the setting of the video gain or "contrast control" R1. When separation is done at this point the last I-F transformer secondary, L-2, is usually phased so that the negative half of the video carrier on the last IF amplifier grid is rectified and employed for sync control. This is done to take advantage of the fact that strong noise impulses will be "clipped", to some extent, since they are more negative than the sync pulses and will drive the last IF amplifier tube beyond plate cut-off, thus causing it to become a "limiter". The action of tube T3 at this point has been covered on pages 88-89 and illustrated in Figure 93.

Sync signal separation at point "B" occurs after rectification of the video carrier and since the rectified video has passed through the amplifier tube T4, the polarity of the signal will be negative as shown by the wave form at point "B" of Figure 108. A signal taken at this point is usually passed through an inverter stage to reverse its polarity and then applied to a sync separator (the triode type covered by Figure 95A or the pentode type of Figure 96).

Separation of the pulse by tubes T5 or T6, as shown at "C" and "D", occur at high level and require very little, if any, additional amplification. When the method represented by tube T5 is used, the tube fulfills only the function of sync separation. The pulse at "C" is negative with respect to ground and can be used for the direct control of cathode-coupled multivibrators after differentiation or integration.

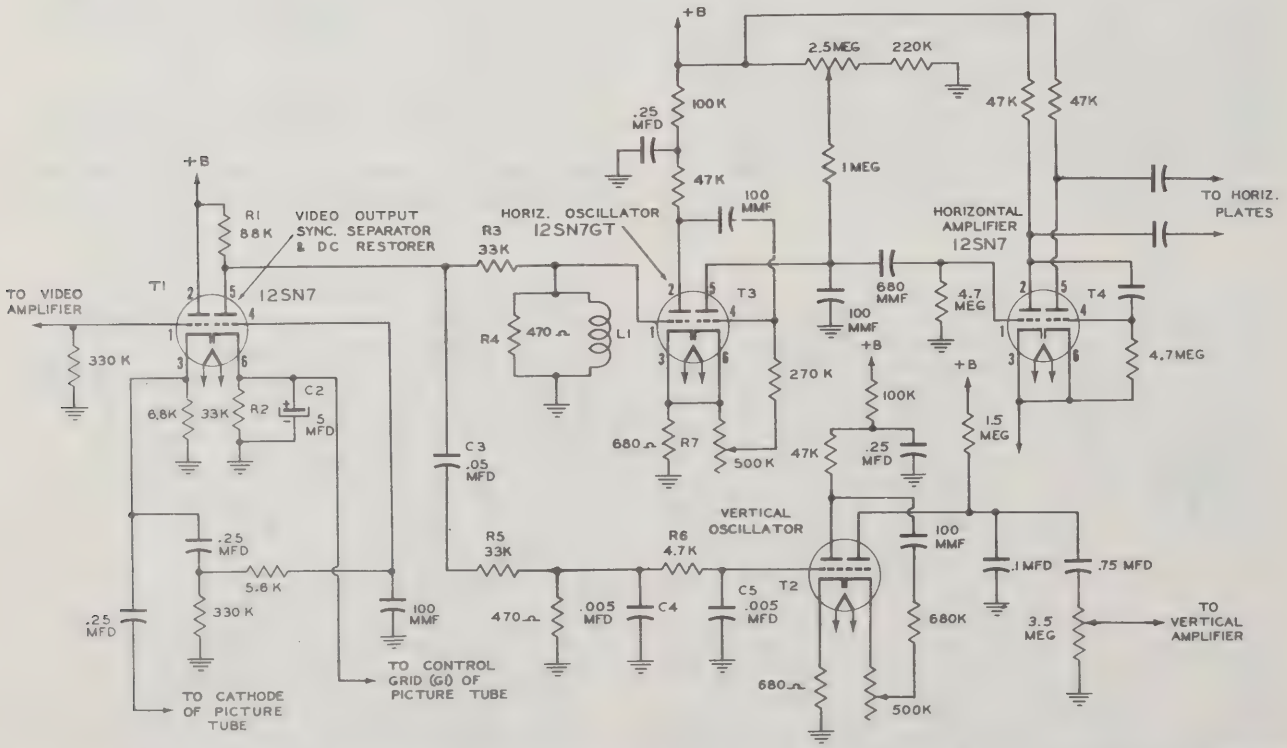



Fig. 109. Horizontal Sync Pulse Differentiation by Means of a Tuned Circuit. (Also See Figure 100C)

When diode tube T6 is employed, it serves the dual function of sync separation and DC restoration. Restoration of the direct current component of the signal is required since the use of capacitance-coupled video amplifiers causes the loss of DC component present in the video signal. The necessity for restoration of the DC component, which is responsible for the average background lighting of the scene, will be covered when we consider the video signal in greater detail.

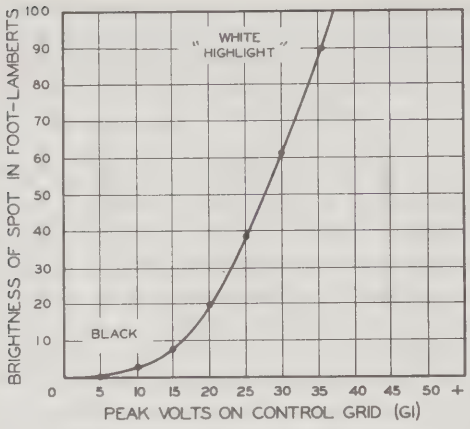
It should be noted that any particular television receiver circuit will employ only one of the sync separation tubes shown, and that the circuit of Figure 108 would reduce to four tubes rather than the six tubes shown. One exception to this reduction exists when the horizontal pulses are taken off by one separator, such as tube T3, and the vertical pulses at a later tube, such as T5 or T6.

Figure 109 shows an unusual sync separation system in which a single type 12SN7 tube is employed for the functions of video output, DC restoration and sync separation. In this case, the second section of tube T1 acts as a "kangaroo" cathode follower. The plate load of this tube, resistor R1, develops the sync pulses. The long time constant circuit comprised of R2 and C2 develop the direct current bias required for restoration of the background lighting level. Separation of the vertical sync pulses is accomplished by coupling the vertical oscillator tube T2 directly to the plate of tube T1 through the integrating network consisting of C3, R5, C4, R6, and C5.

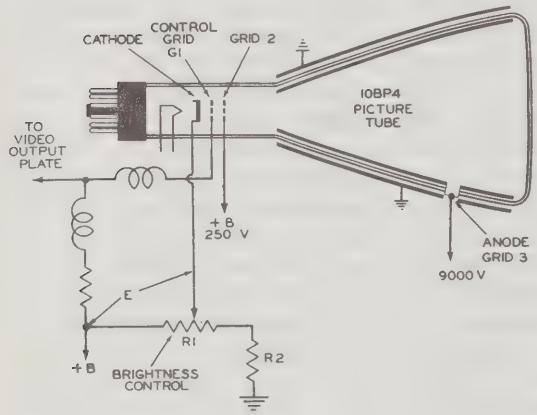
Horizontal pulse differentiation is accomplished by the use of a tuned circuit comprised of inductor L1 and its associated circuit capacitances. This circuit is resonant at a frequency of approximately 110 kilocycles and is allowed to oscillate for one half-cycle or 5 microseconds. This use of resonance was covered in the text of page 96 and illustrated in Figure 100. Since this first half-cycle pulse controls a cathode-coupled multivibrator, it must be a "negative-going" pulse as discussed under the description of pulse control, pages 54-56. The input section of tube T3 has a net bias determined by its cathode resistor R7 and the divider from the plate circuit of tube T1. This plate circuit network consists of R1, R3 and the parallel resistance of L1 and R4. Resistor R4 "damps" the shock-excited oscillation of the tuned circuit, caused by the horizontal sync pulses. This damping prevents the continuance of oscillation beyond the first half-cycle, which is required for the control of the horizontal scanning oscillator tube T3.

SUMMARY OF SYNCHRONIZATION METHODS AND SYSTEMS: As explained in the introduction to this course, the major difference between television receivers and other types of radio equipment, is the group of circuits which are peculiar to the formation of a cathode-ray produced image, and its control by scanning systems at the transmitter and receiver. The horizontal and vertical scanning systems, the use of pulses as part of the television carrier for control of scanning, and the methods of segregating or separating these pulses have been covered in considerable detail up to this point. Experience with television receivers, which have been in service for the past several years in metropolitan areas, discloses the interesting fact that the majority of service failures have occurred in the scanning and synchronization circuits of these sets. In many cases, the trouble has been readily traced to vacuum tube failures, especially in multivibrator and blocking oscillator circuits. Ageing of components of these oscillator circuits has quite often been responsible for a drift of frequency. This is usually serious enough to cause failure of the receiver scanning to "lock-in" with the transmitted signal. The service technician is urged to study these portions of the television system thoroughly, since the proper installation of new receivers and the maintenance of those in service, will, in the majority of cases, require adjustment or repair of scanning and synchronization circuits.

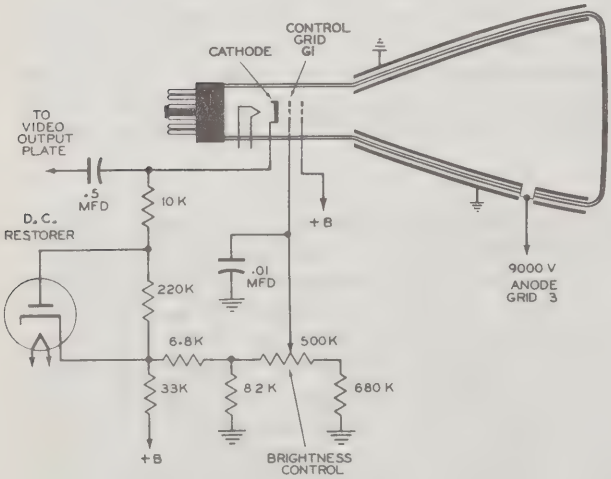
BRIGHTNESS CONTROL: Our previous study of the television receiver system has concerned itself with the motion of the electron beam in the picture tube to accomplish scanning of the picture area. It was shown in Chapter 1, pages 4 through 7, that the intensity of illumination of the cathode-ray screen surface could be controlled by a grid cylinder in the picture tube "gun" structure. We have indicated at several points in the text that the variation of video or picture signal on this control grid is responsible for the instantaneous changes of spot illumination which make up the elements of the picture. The signal voltage on this control element is negative in nature so that a swing in the negative direction produces a darker spot. Finally, at some critical negative




(A) BRIGHTNESS-VERSUS VOLTAGE - GRID 1




B. "BRIGHTNESS" CONTROL WITH GRID AT HIGH SIDE OF CIRCUIT.




C. BRIGHTNESS CONTROL IN CIRCUIT WITH CATHODE AT HIGH SIDE OF VIDEO OUTPUT.

Fig. 110. Control Characteristic of 10BP4 Picture Tube

voltage, the spot of light is entirely extinguished.

Figure 110 shows the relation of the control grid voltage to the brightness of the picture spot for a typical ten inch picture tube (Type 10BP4). In this particular tube, with normal voltages on other elements, the spot is extinguished (picture tube black) for all grid voltages below a value of positive five volts. A swing to a positive 35 volts on the control grid, with respect to the cathode, produces the brightest spot or "highlight" of the picture.

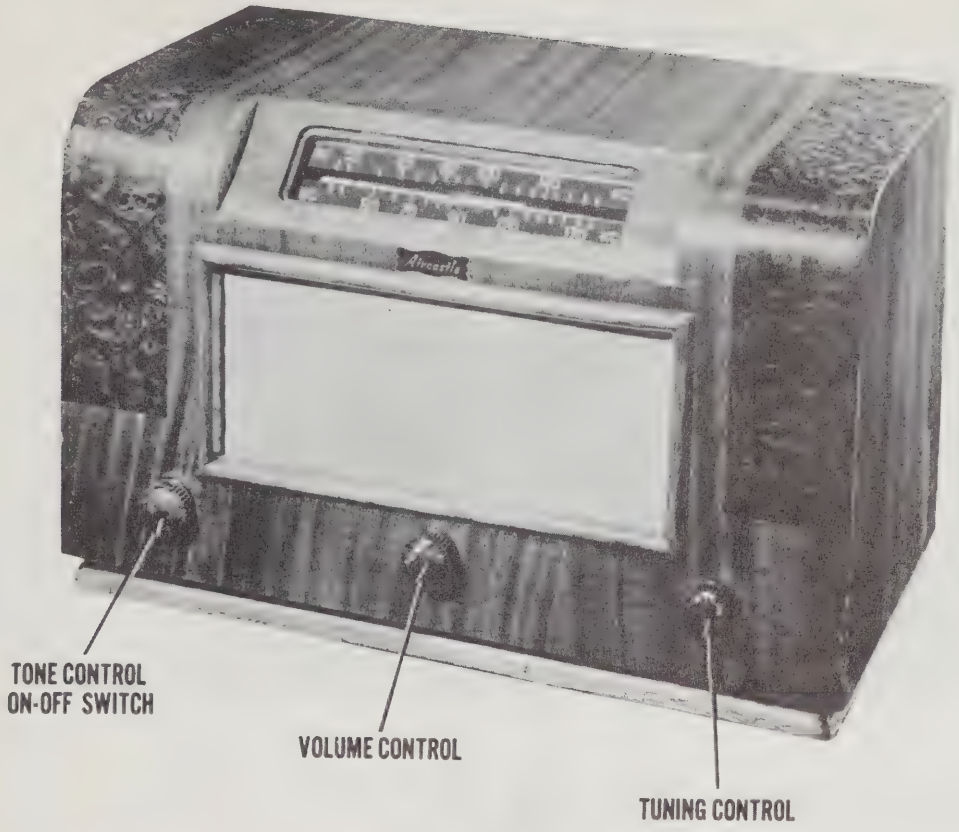
One of the essential controls of the television receiver is an adjustment of the bias on the grid to assure that the blanking level or pedestal of the signal occurs at the "black" point which, in the case of this particular tube, would be 5 volts. Figure 110B shows a bias system in which the voltage, E, established by the adjustment of potentiometer R1 biases control grid G1 with respect to cathode and determines the correct picture brightness. In this case, the polarity of the video signal is such that the plate of the video output tube is connected to the control grid. It is possible to operate the picture tube with the control grid connected to the low side of the video output stage and the cathode coupled to the high or plate side, as shown in Figure 110C.

In either case, the "brightness" control is a voltage adjustment of the bias between the control grid and cathode, which establishes the correct blanking or black level.

As the "brightness" control is adjusted, with no picture signal present, a point will be reached at which the vertical retrace lines, caused by the motion of the spot from bottom to top of the picture, will become visible. The control should be adjusted in a counter clockwise direction until these lines just disappear. The "brightness" control, as well as the "contrast" control, are normally made "front panel" or customer operated, to allow adjustment of picture quality to accommodate the existing conditions of room illumination.

Installment 10 will summarize the function and operation of those controls which require adjustment by the service technician.

AIRCASTLE MODELS
5008, 5009




AIRCASTLE MODELS
5008, 5009

AIRCASTLE MODEL 5008

| | |
|---|---|
| **TRADE NAME** | Aircastle, Models 5008, 5009 |
| **SUPPLIER** | Spiegel, Inc., 1061 W. 35th St., Chicago, Ill. |
| **TYPE SET** | AC-DC Operated Superheterodyne Receiver with Loop Antenna |
| **TUBES (SIX)** | Types, 12BA6 RF Amp., 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 35L6GT Power Output, 35W4 Rectifier. |
| **POWER SUPPLY** | 110-125 Volts AC-DC |
| **TUNING RANGE—BROADCAST** | 540-1730KC RATING .20 Amp. @ 117 Volts AC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to rear stator of tuning cap. Low side to B-. | 455KC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If isolation transformer is not used reduce dummy antenna to .001 MFD to reduce hum modulation. |
| 2 | .1 MFD. | " | 1730KC | " | " | A5 | Adjust for maximum output. |
| 3 | 200MMFD. | High side to ext. ant. lead. Low side to B-. | 1400KC | Tune for maximum output. | " | A6 | " " " " |
| 4 | 200MMFD. | " | 600KC | " | " | A7 | Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 & 4 until no further improvement can be made. |

**HOWARD W. SAMS & CO., INC.** Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc."

Printed in U. S. of America
DATE 9/48-#4816-1 SET #46-FOLDER #1

# PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL 5008, 5009

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| | | AIRCASTLE PART No. | STANDARD REPLACEMENT | | |
| 1 | RF Amp. | 12BA6 | 12BA6 | 7BK | |
| 2 | Converter | 12BE6 | 12BE6 | 7CH | |
| 3 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| 4 | Det.-AVC-AF | 12AT6 | 12AT6 | 7BT | |
| 5 | Power Output | 35L6GT | 35L6GT | 7AC | |
| 6 | Rectifier | 35W4 | 35W4 | 5BQ | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | AIRCASTLE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 7A | 40 | 150 | EC12 | PRSA150/40-20 | EDL4215 | DSB-3x20-150* | TA-240 | Filter-Red |
| B | 20 | 150 | | | | | | " -White |
| 8 | .05 | 600 | | 684-05 | DT6S5 | ST-6-05 | TC-15 | Line Filter |
| 9 | .25 | 400 | | 484-.25 | DT4P25 | ST-4-25 | 72P3 | Line Isolation |
| 10 | .01 | 400 | PC-7 | 484-.01 | DT4S1 | ST-4-01 | TC-11 | Output Plate Bypass |
| 11 | .01 | 400 | PC-7 | 484-.01 | DT4S1 | ST-4-01 | TC-11 | Audio Coupling |
| 12 | .05 | 600 | | 684-.05 | DT6S5 | ST-6-05 | TC-15 | Tone Comp. |
| 13 | .01 | 400 | PC-7 | 484-.01 | DT4S1 | ST-4-01 | TC-11 | Audio Coupling |
| 14 | .05 | 600 | | 684-.05 | DT6S5 | ST-6-05 | TC-15 | AVC Filter |
| 15 | .01 | 400 | PC-7 | 484-.01 | DT4S1 | ST-4-01 | TC-11 | Ant. Coupling |
| 16 | 250 | 500 | | 1468-.00025 | 5W5T25 | MO.5-325 | 1FM-325 | AF Plate Bypass |
| 17 | 200 | 500 | | 1468-.0002 | 5W5T2 | MO.5-32 | 1FM-32 | Diode RF Filter |
| 18 | 200 | 500 | | 1468-.0002 | 5W5T2 | MO.5-32 | 1FM-32 | RF Coupling |
| 19 | 50 | 500 | MC-4 | 1468-.00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap. |
| 20 | 20 | 500 | | | 5R5Q2 | MOS.5-42 | MS-42 | Fixed Padder |

*Parallel sections to obtain desired capacity.

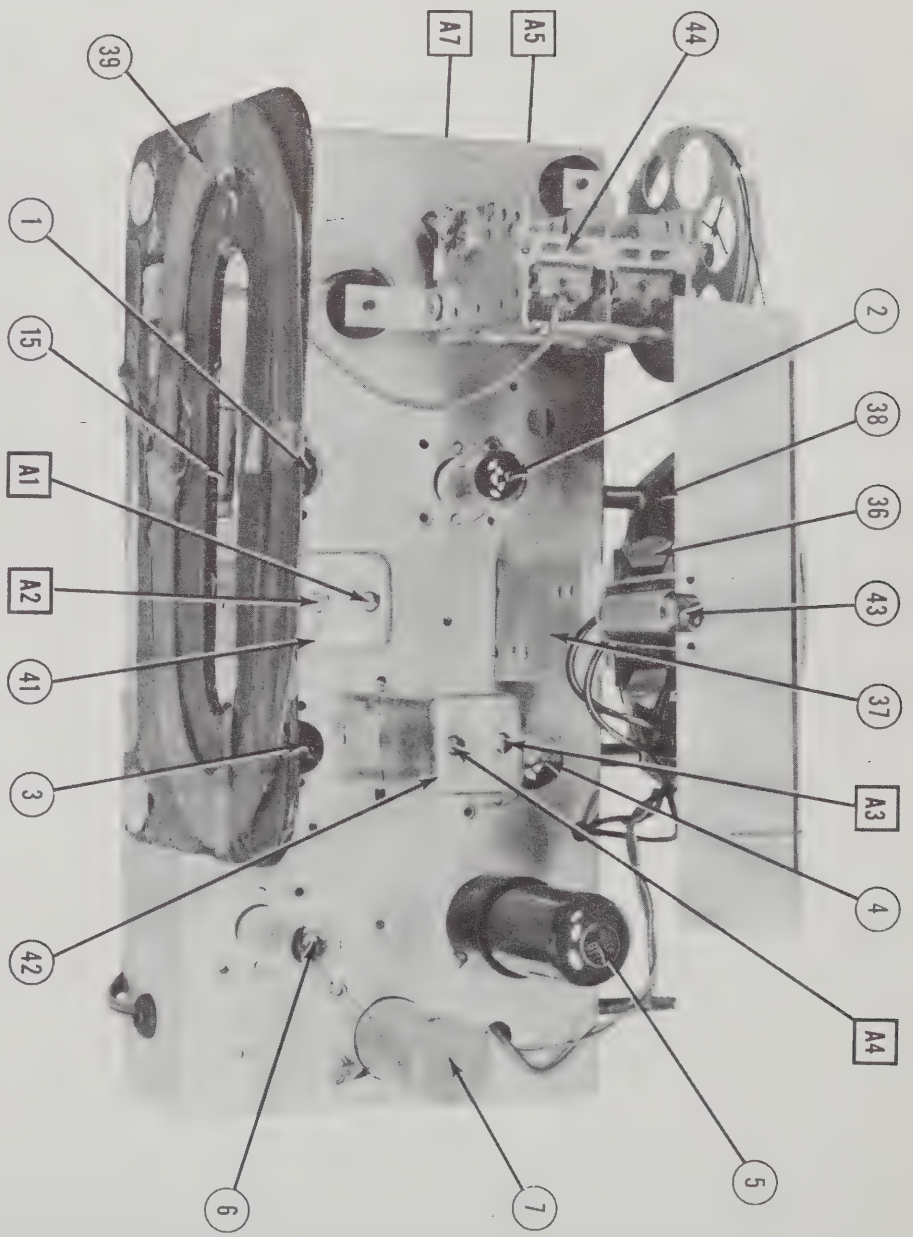
## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | AIRCASTLE PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 21A | 1 Meg. | ½ | VC-2 | D13-137 | M-63-2 | Volume Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 21A per instructions |
| 22A | 25KΩ | ½ | VC-1 | D11-120 | AM-40-8 | Tone Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 22A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | AIRCASTLE PART No. | IRC PART No. | |
| 23 | 4000Ω | ½ | 1R-22 | BTS-3900 | Yl.-Blk.-Red RF Plate Load |
| 24 | 47KΩ | ½ | 1R-10 | BTS-47K | Yl.-Vi.-Or. Conv. Grid |
| 25 | 20KΩ | ½ | 1R-9 | BTS-22K | Red-Blk.-Or. Osc. Grid |
| 26 | 3.3 Meg. | ½ | 1R-23 | BTS-3.3 Meg | Or.-Or.-Grn. AVC Network |
| 27 | 47KΩ | ½ | 1R-10 | BTS-47K | Yl.-Vi.-Or. Diode Filter |
| 28 | 2.2 Meg. | ½ | 1R-13 | BTS-2.2 Meg | Red-Red-Grn. AF Grid |
| 29 | 470KΩ | ½ | 1R-11 | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 30 | 470KΩ | ½ | 1R-11 | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 31 | 220Ω | ½ | 1R-5 | BW-½-220 | Red-Red-Br. Output Cathode |
| 32 | 2200Ω | 1 | 1R-15 | BTA-2200 | Red-Red-Red Filter |
| 33 | 33Ω | ½ | 1R-17 | BW-½-33 | Or.-Or.-Blk. Rect. Ballast |
| 34 | 220KΩ | ½ | 1R-20 | BTS-220K | Red-Red-Yl. Line Isolation |
| 35 | 150Ω | ½ | | BW-½-150 | Br.-Grn.-Br. IF Cathode |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | AIRCASTLE PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 36 | 2600Ω | 3.0Ω | 270Ω | .7Ω | Part of SPK-9 | A-3876‡ | T22S45‡ | A-2928‡ | ‡Bend mounting tabs down, file out slots and mount on original brackets. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | AIRCASTLE PART No. | JENSEN PART No. | QUAM PART No. | |
| 37 | FIELD<br>PM | VC IMP.<br>3Ω | SPK-9 | ST-105<br>Mod. P5-X | 5A15 | |
| 38 | CONE DIA.<br>4‡" | VC DIA.<br>9/16" | | | | |

## R F COILS

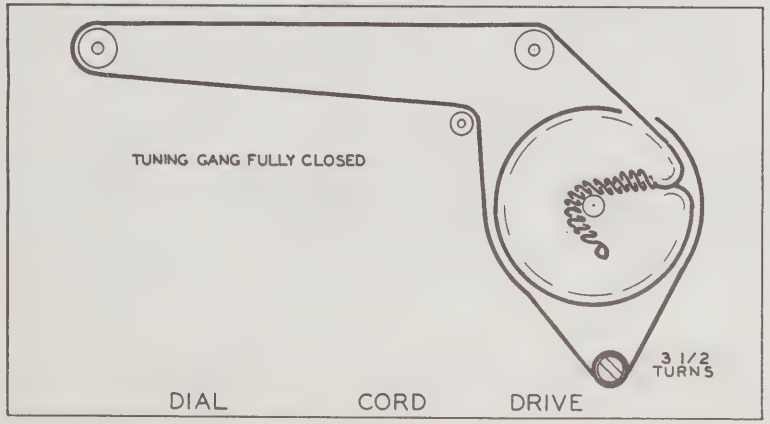
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | AIRCASTLE PART No. | MEISSNER PART No. | |
| 39 | Loop Ant. | .1Ω | 1.4Ω | LL-2 | | |
| 40 | Osc. Coil | 1.5Ω | 6Ω | LO-3 | 14-1060 | |
| 41 | Input IF | 20.5Ω | 20.5Ω | LI-6 | 16-6666 | |
| 42 | Output IF | 20.5Ω | 20.5Ω | LI-7 | 16-6667 | |

## DIAL LIGHT

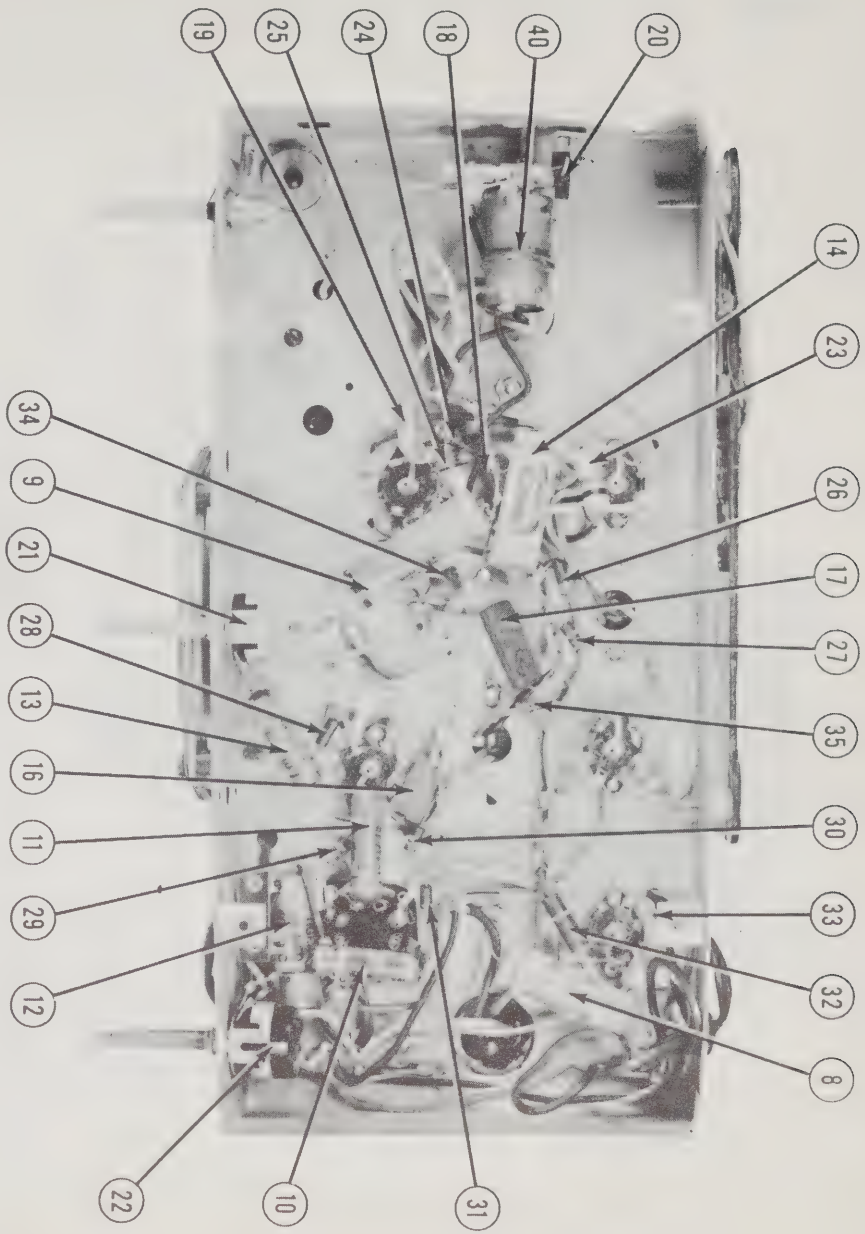
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | AIRCASTLE PART No. | | |
| 43 | Bayonet | 6-8 | 0.15 | Brown | PB-1 | | Type 47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | AIRCASTLE PART No. | NOTES |
|---|---|---|---|
| 44 | 2 Gang Var. Cap. | GC-1 | (16-562 MMF, 15-475 MMF) |
| A6 | Trimmer | TC-7 | Ant. Adj. |
| A7 | Padder | TC-9 | Osc. " |



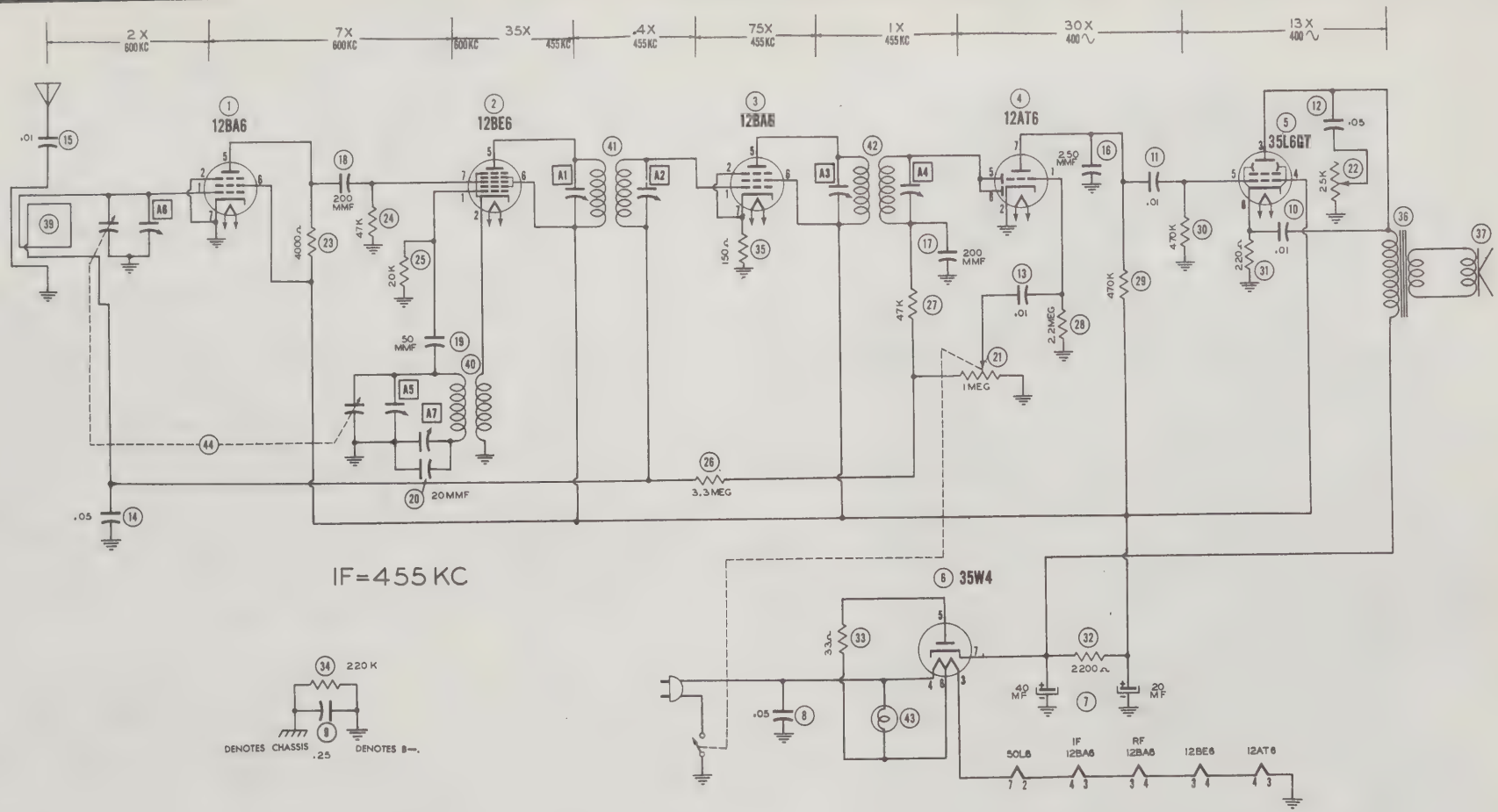

# CHASSIS—BOTTOM VIEW








AIRCASTLE MODELS 5008, 5009




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12BA6 | -.2VDC | 0V. | 39VAC | 27VAC | 45VDC | 70VDC | 0V. | - |
| 2 | 12BE6 | -4.5VDC§ | 0V. | 27VAC | 13VAC | 70VDC | 70VDC | -.2VDC | - |
| 3 | 12BA6 | -.2VDC | 1VDC | 39VAC | 50VAC | 70VDC | 70VDC | 1VDC | - |
| 4 | 12AT6 | -.2VDC | 0V. | 0V. | 13VAC | -1.4VDC | -1.4VDC | .8VDC | - |
| 5 | 35L6GT | 0V. | 50VAC | 120VDC | 70VDC | 0V. | 0V. | 85VAC | 5.2VDC |
| 6 | 35W4 | 0V. | 0V. | 85VAC | 117VAC | 113VAC | 115VAC | 125VAC | - |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12BA6 | 4.3 Meg. | 0Ω | 38Ω | 25Ω | 46KΩ | 42KΩ | 0Ω | - |
| 2 | 12BE6 | 22KΩ | 1.5Ω | 25Ω | 13Ω | 42KΩ | 42KΩ | 47KΩ | - |
| 3 | 12BA6 | 4.3 Meg. | 150Ω | 38Ω | 50Ω | 42KΩ | 42KΩ | 150Ω | - |
| 4 | 12AT6 | 2.2 Meg. | 0Ω | 0Ω | 13Ω | 1 Meg. | 1 Meg. | 510KΩ | - |
| 5 | 35L6GT | INF. | 50Ω | 40KΩ | 42KΩ | 47OKΩ | INF. | 85Ω | 220Ω |
| 6 | 35W4 | INF. | INF. | 85Ω | 120Ω | 150Ω | 115Ω | 40KΩ | - |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

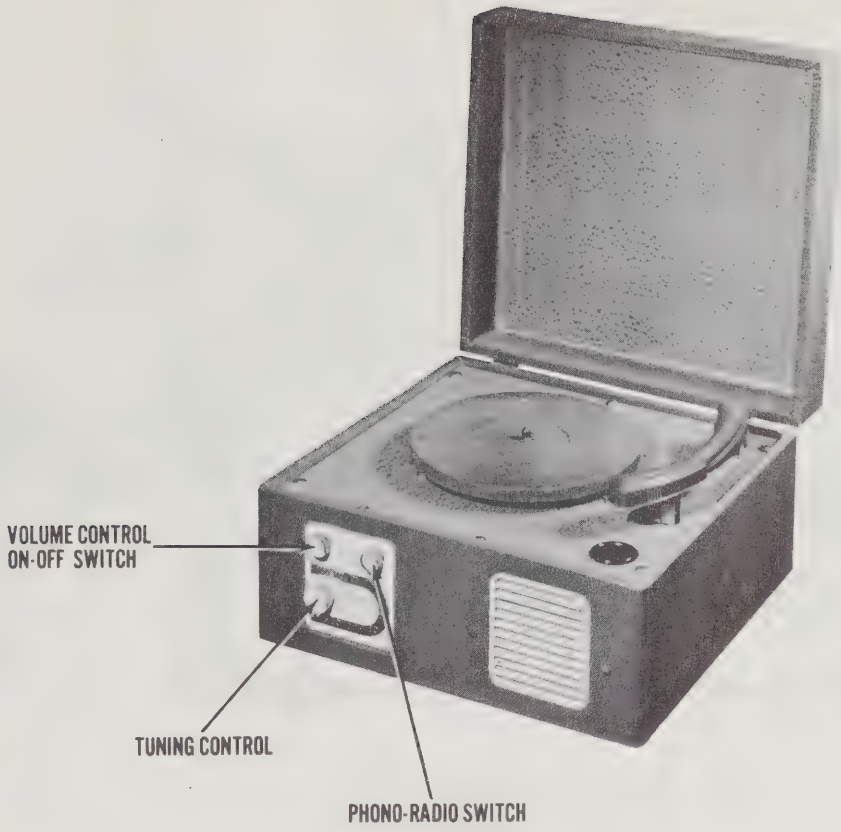
©Howard W. Sams & Co., Inc. 1948

4816-1

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRCASTLE MODEL
5035




AIRCASTLE MODEL
5035

AIRCASTLE MODEL 5035

| | |
|---|---|
| **TRADE NAME** | Aircastle, Model 5035 |
| **SUPPLIER** | Spiegel, Inc., 1061 W. 35th St., Chicago, Ill. |
| **TYPE SET** | AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna |
| **TUBES** (FIVE) | Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier. |
| **POWER SUPPLY** | 110-125 Volts AC |
| **TUNING RANGE—BROADCAST** | 540-1650KC RATING .22 Amp. @ 117 Volts AC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to stator of rear section of tuning cap. Low side to B-. | 455KC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation. |
| 2 | .1 MFD. | " | 1650KC | " | " | A5 | Adjust for maximum output. |
| 3 | Loop | | 1400KC | Tune for maximum output. | " | A6 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |

**HOWARD W. SAMS & CO., INC.** **Indianapolis Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc."
Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL 5035

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: AIRCASTLE PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | Converter | 12BE6 | 12BE6 | 7CH | |
| 2 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| 3 | Det.-AVC-AF | 12AT6 | 12AT6 | 7BT | |
| 4, | Power Output | 50B5 | 50B5 | 7BZ | |
| 5 | Rectifier | 35W4 | 35W4 | 5BC | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: AIRCASTLE PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: SOLAR PART No. | REPLACEMENT DATA: SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 6A | 40 | 150 | EC-12 | PRSA150/40-20 | EDL4215 | DSB2x40-150 | TA240 | Filter-Red |
| B | 20 | 150 | | | | | | " -Yellow |
| 7 | .05 | 400 | PC-5 | 484-.05 | DT4S5 | ST-4-05 | TC-15 | Line Filter |
| 8 | .1 | 400 | PC-8 | 484-.1 | DT4P1 | ST-4-1 | 72P2 | Line Isolation |
| 9 | .01 | 600 | | 684-.01 | DT6S1 | ST-6-01 | TC-11 | Output Plate Bypass |
| 10 | .005 | 600 | PC-6 | 684-.005 | DT6D5 | ST-6-005 | TC-25 | Audio Coup. |
| 11 | .005 | 600 | PC-6 | 684-.005 | DT6D5 | ST-6-005 | TC-25 | " " |
| 12 | .05 | 400 | PC-5 | 484-.05 | DT4S5 | ST-4-05 | TC-15 | AVC Filter |
| 13 | .05 | 400 | PC-5 | 484-.05 | DT4S5 | ST-4-05 | TC-15 | Phono Isolation |
| 14 | 250 | 500 | | 1468-.00025 | 5W5T25 | MO.5-325 | 1FM-325 | AF Plate Bypass |
| 15 | 500 | 500 | MC-5 | 1468-.0005 | 5W5T5 | MO.5-35 | 1FM-35 | Phono Tone Comp. |
| 16 | 100 | 300 | MC-2 | 1468-.0001 | 5W5T1 | MO.5-31 | 1FM-31 | Diode RF Filter-Cer. |
| 17 | 50 | 500 | MC-4 | 1469-.00005 | 5R5Q5 | MOS.5-45 | MS-45 | Osc. Grid Cap. |

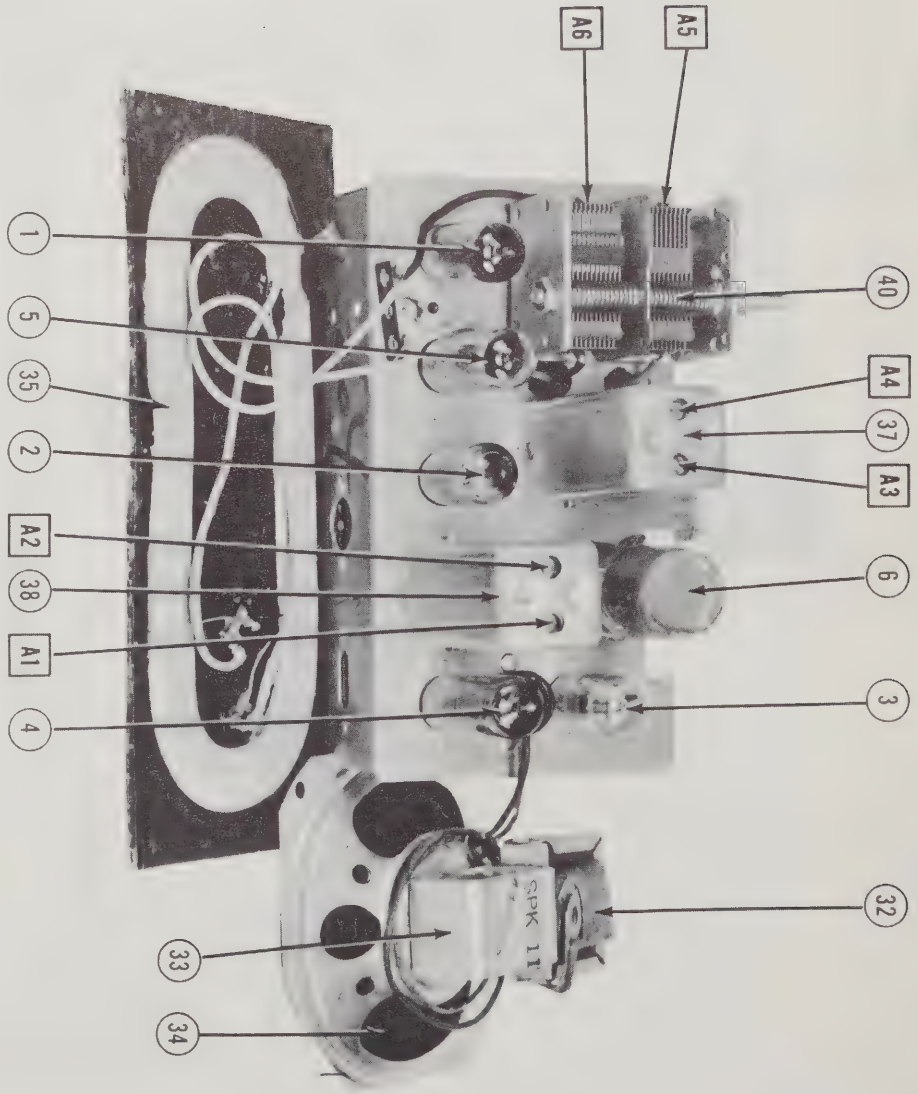
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: AIRCASTLE PART No. | REPLACEMENT DATA: IRC PART No. | REPLACEMENT DATA: CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 18A | 1 Meg. | ½ | VC-9 | D13-137 | AM-63-Z | Volume Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 18A per instructions |
| C | Switch | | " " | 41 | 8W-A | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: AIRCASTLE PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 19 | 22KΩ | ½ | 1R-9 | BTS-22K | Red-Red-Or. Osc. Grid |
| 20 | 3.3 Meg. | ½ | 1R-23 | BTS-3.3 Meg. | Or.-Or.-Grn. AVC Network |
| 21 | 100KΩ | ½ | 1R-19 | BTS-100K | Br.-Blk.-Yl. Diode Filter |
| 22 | 2.2 Meg. | ½ | 1R-13 | BTS-2.2 Meg. | Red-Red-Grn. AF Grid |
| 23 | 470KΩ | ½ | 1R-11 | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 24 | 470KΩ | ½ | 1R-11 | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 25 | 150Ω | ½ | 1R-14 | BW-½-150 | Br.-Grn.-Br. Output Cathode |
| 26 | 2200Ω | 1 | 1R-25 | BTA-2200 | Red-Red-Red Filter |
| 27 | 33Ω | ½ | 1R-33 | BW-½-33 | Or.-Or.-Blk. Surge Limiter |
| 28 | 33Ω | ½ | 1R-33 | BW-½-33 | Or.-Or.-Blk. Rect. Ballast |
| 29 | 220KΩ | ½ | 1R-20 | BTS-220K | Red-Red-Yl. Phono Tone Comp. |
| 30 | 470KΩ | ½ | 1R-11 | BTS-470K | Yl.-Vi.-Yl. Phono Tone Comp. |
| 31 | 220KΩ | ½ | 1R-20 | BTS-220K | Red-Red-Yl. Line Isolation |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | AIRCASTLE PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 32 | 2000Ω | 3.6Ω | 176Ω | .6Ω | Part of SPK-11 | A-3876# | T-22S45# | A-2028# | #Bend mounting tabs down, file out slots and mount on original brackets. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | AIRCASTLE PART No. | JENSEN PART No. | QUAM PART No. | |
| | FIELD | VC IMP. | | ST-113‡ | | |
| 33 | PM | 3.6Ω | SPK-11 | Mod. P4-X | 4A07‡ | ‡Trim Flange |
| | CONE DIA. | VC DIA. | | | | |
| 34 | 4" | 9/16" | | | | |

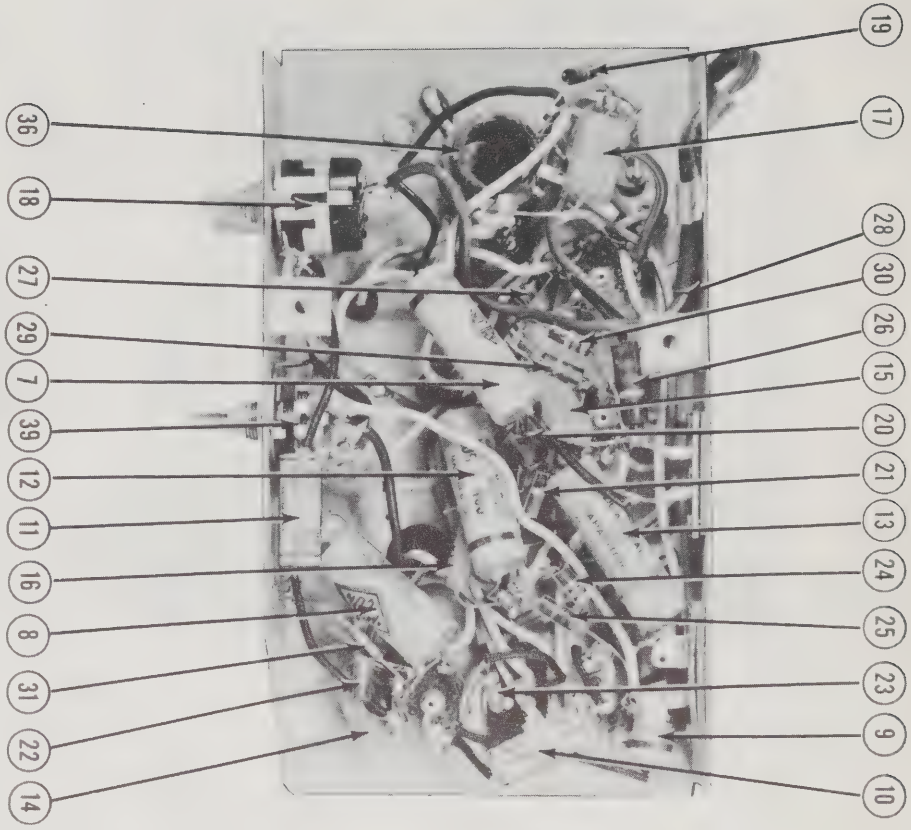
## R F COILS

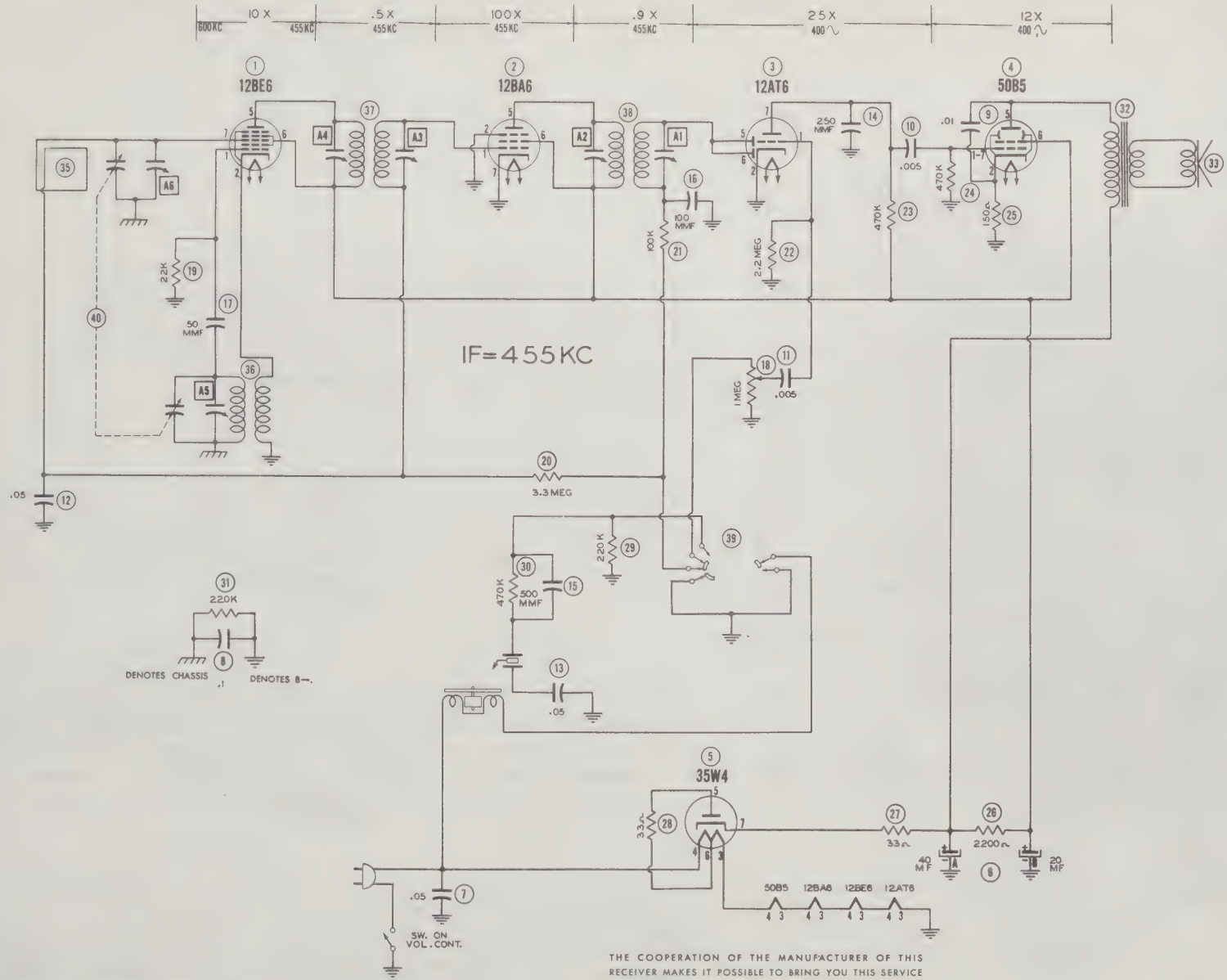
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | AIRCASTLE PART No. | MEISSNER PART No. |
| 35 | Loop Ant. | | 2Ω | LL-11 | |
| 36 | Osc. Coil | .7Ω | 7Ω | LO-13 | 14-1060 |
| 37 | Input IF | 22Ω | 22Ω | LI-2 | 16-6658 |
| 38 | Output IF | 21.2Ω | 21.6Ω | LI-6 | 16-6660 |

## MISCELLANEOUS

| ITEM No. | PART NAME | AIRCASTLE PART No. | NOTES |
|---|---|---|---|
| 39 | Switch | SW-7 | Radio-Phono |
| 40 | 2 Gang Var. Cap. | GC-7X | (18-452MMF, 33-197MMF) |

# CHASSIS—BOTTOM VIEW






| Pin No. | 12BE6 Volt. | 12BE6 Res. | [illegible] Volt. | [illegible] Res. |
|---|---|---|---|---|
| 1 | -4.8VDC§ | 22KΩ | -.2VDC | 4.4 Meg. |
| 2 | 0V. | .7Ω | 0V. | 0Ω |
| 3 | 12VAC | 13Ω | 25VAC | 26Ω |
| 4 | 25VAC | 26Ω | 37VAC | 38Ω |
| 5 | 80VDC | 100KΩ | 80VDC | 100KΩ |
| 6 | 80VDC | 100KΩ | 80VDC | 100KΩ |
| 7 | 0V. | 4.4 Meg. | 0V. | 0Ω |

| Pin No. | 12AT6 Volt. | 12AT6 Res. | 50B5 Volt. | 50B5 Res. |
|---|---|---|---|---|
| 1 | -.5VDC | 2.2 Meg. | 0V. | 470KΩ |
| 2 | 0V. | 0Ω | 6VDC | 150Ω |
| 3 | 0V. | 0Ω | 37VAC | 38Ω |
| 4 | 12VAC | 13Ω | 85VAC | 90Ω |
| 5 | -.2VDC | 1.1 Meg. | 115VDC | 100KΩ |
| 6 | -.2VDC | 1.1 Meg. | 80VDC | 100KΩ |
| 7 | 40VDC | 570KΩ | 0V. | 470KΩ |

| Pin No. | 35W4 Volt. | 35W4 Res. |
|---|---|---|
| 1 | 120VDC | 100KΩ |
| 2 | 120VDC | 100KΩ |
| 3 | 85VAC | 90Ω |
| 4 | 117VAC | 130Ω |
| 5 | 115VAC | 170Ω |
| 6 | 110VAC | 120Ω |
| 7 | 125VDC | 100KΩ |

§TAKEN WITH VACUUM TUBE VOLTMETER. RADIO-PHONO SWITCH IN RADIO POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

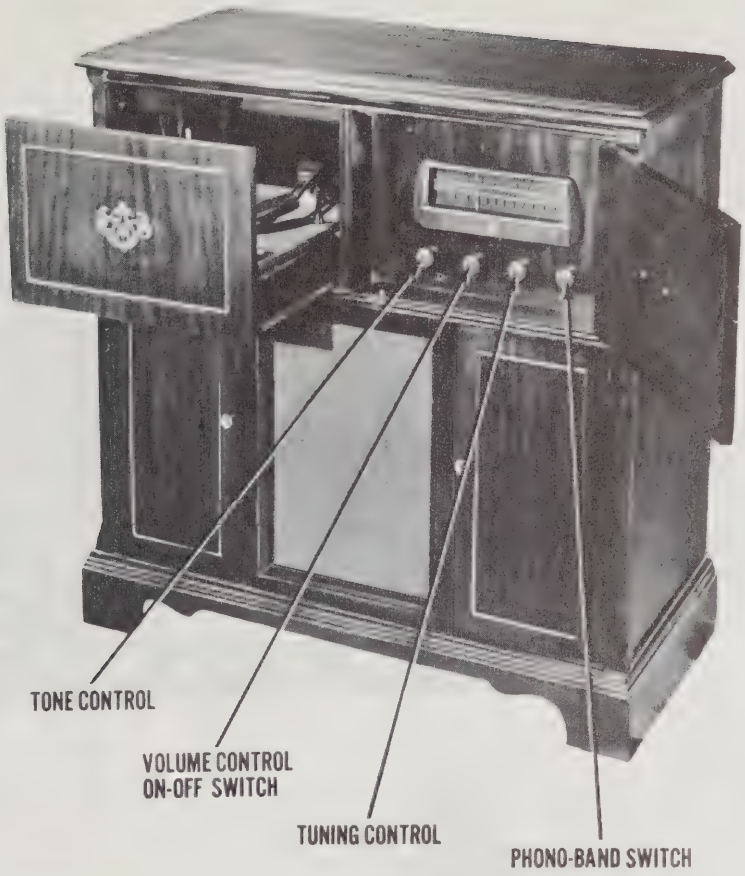
©Howard W. Sams & Co., Inc. 1948

4816-2

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRLINE MODELS
84WG-2721A, 84WG-2721B




AIRLINE MODELS
84WG-2721A, 84WG-2721B

AIRLINE MODEL 84WG-2721A

| | |
|---|---|
| **TRADE NAME** | Airline, Model 84WG-2721A, 84WG-2721B |
| **SUPPLIER** | Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill. |
| **TYPE SET** | AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Ant. |
| **TUBES** (SEVEN) | Types, 6BE6 AM-FM Conv., 6BA6 1st IF Amp., 6BA6 2nd IF Amp., 6AL5 Ratio Detector, 6AV6 Det.-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier. |
| **POWER SUPPLY** | 105-125 Volts AC RATING .50 Amp. @ 117V AC |
| **TUNING RANGE—BROADCAST** | 540-1600KC FREQ. MOD. 88-108MC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Use insulated alignment screwdriver for all adjustments.
Allow receiver and sig. gen. to warm up for at least fifteen minutes before attempting alignment.

**AM ALIGNMENT**

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to Pin 1 (grid) of 6BA6 1st IF Tube (2). Low side to chassis. | 455KC | BC (Center position) | Tuning cap. fully open. | Across voice coil | A1,A2 | Adjust for maximum output. |
| 2 | .1 MFD. | High side to Pin 7 (grid) of 6BE6. Low side to chassis. | " | " | " | " | A3,A4 | " " " " |
| 3 | .1 MFD | " | 1620KC | " | " | " | A5 | " " " " |
| 4 | 50 MMFD | High side to ext. ant. lead. Low side to chassis. | 1400KC | " | Tune for max. output. | " | A6 | Adjust for maximum output Set dial pointer to 1400 KC calibration mark. |

FOR FM ALIGNMENT SEE PAGE FOUR OF THIS FOLDER.

**HOWARD W. SAMS & CO., INC.** **Indianapolis , Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-3 SET #46-FOLDER #3

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: AIRLINE PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | AM-FM Conv. | 6BE6 | 6BE6 | 7CH | |
| 2 | 1st IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 3 | 2nd IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 4 | Ratio Detector | 6AL5 | 6AL5 | 6BT | |
| 5 | Det.-AVC-AF | 6AV6 | 6AV6 | | |
| 6 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 7 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: AIRLINE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 8A | 40 | 350 | 45X359 | | UF431450* | DY406 | EL-432 | Filter |
| B | 40 | 350 | | | BR2045 | | | " |
| C | 20 | 350 | | | | | | " |
| D | 20 | 25 | | | | | | Cathode Bypass |
| 9 | 5 | 100 | 45X361 | PRS150/4 | BR415 | M-4-450 | UT-41 | Stabalizing Cap. |
| 10 | .001 | 800 | H66102 | 684-001 | DT6D1 | ST-6-001 | TC-21 | Output Plate Bypass |
| 11 | .004 | 200 | B66402 | 484-004 | DT6D4 | ST-6-004 | TC-24 | Tone Comp. |
| 12 | .04 | 200 | B66403 | 484-04 | DT4S4 | ST-6-04 | TC-14 | " " |
| 13 | .02 | 400 | D66203 | 484-02 | DT4S2 | ST-4-02 | TC-12 | Audio Coupling |
| 14 | .005 | 400 | D66502 | 484-005 | DT4D5 | ST-6-005 | TC-25 | " " |
| 15 | .01 | 400 | D66103 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Conv. Screen Decoupling |
| 16 | .05 | 200 | B66503 | 484-05 | DT15 | ST-4-05 | TC-15 | AVC Filter |
| 17 | 100 | 500 | 47X476 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | FM Line Ant. Coupling |
| 18 | 470 | 500 | | 1469-0005 | 5R5T5 | MOO.5-35 | MS-35 | ratio Det. Diode Load Cap. |
| 19 | 2700 | 500 | 47X492 | 1467-0025 | 1W5D25 | MW.5-225 | 1FM-23 | De-emphasis |
| 20 | 5000 | 300 | 47X507 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd IF Decoupling-Cer. |
| 21 | 5000 | 300 | 47X507 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd IF Cathode Bypass-Cer. |
| 22 | 5000 | 300 | 47X507 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st IF Decoupling-Cer. |
| 23 | 5000 | 300 | 47X507 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st IF Cathode Bypass-Cer. |
| 24 | 5000 | 300 | 47X507 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Converter Plate Decoup. |
| 25 | 5000 | 300 | 47X507 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Fil. Bypass |
| 26 | 50 | 300 | | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Fixed Trimmer |
| 27 | 47 | 300 | 47X517 | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Conv. Screen Bypass |
| 28 | 10 | 300 | 47X523 | 1469-00001 | 5R5Q1 | MOS.5-41 | MS-41 | Fixed Trimmer |
| 29 | 100 | 300 | | 1469-0001 | 5R5T1 | MOS.5-31 | MS-31 | Fixed Padder |
| 30 | 12 | 300 | 47X522 | | | | | Fixed Trimmer |
| 31 | 6 | 300 | 47X521 | | | | | Fixed Trimmer |
| 32A | 50 | 300 | † | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Diode RF Filter |
| B | 50 | 300 | † | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | " " " |
| 33 | 68 | 500 | 47X471 | 1468-000075 | 5R5Q7 | MOS.5-47 | MS-47 | Tone Comp. |
| 34 | 47 | 300 | 47X517 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap. |
| 35 | 220 | 300 | 47X468 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | AF Plate Bypass |

*Parallel sections to obtain desired capacity.
†Items 32A, 32B and 45 are complete unit obtainable under Part #76X1.

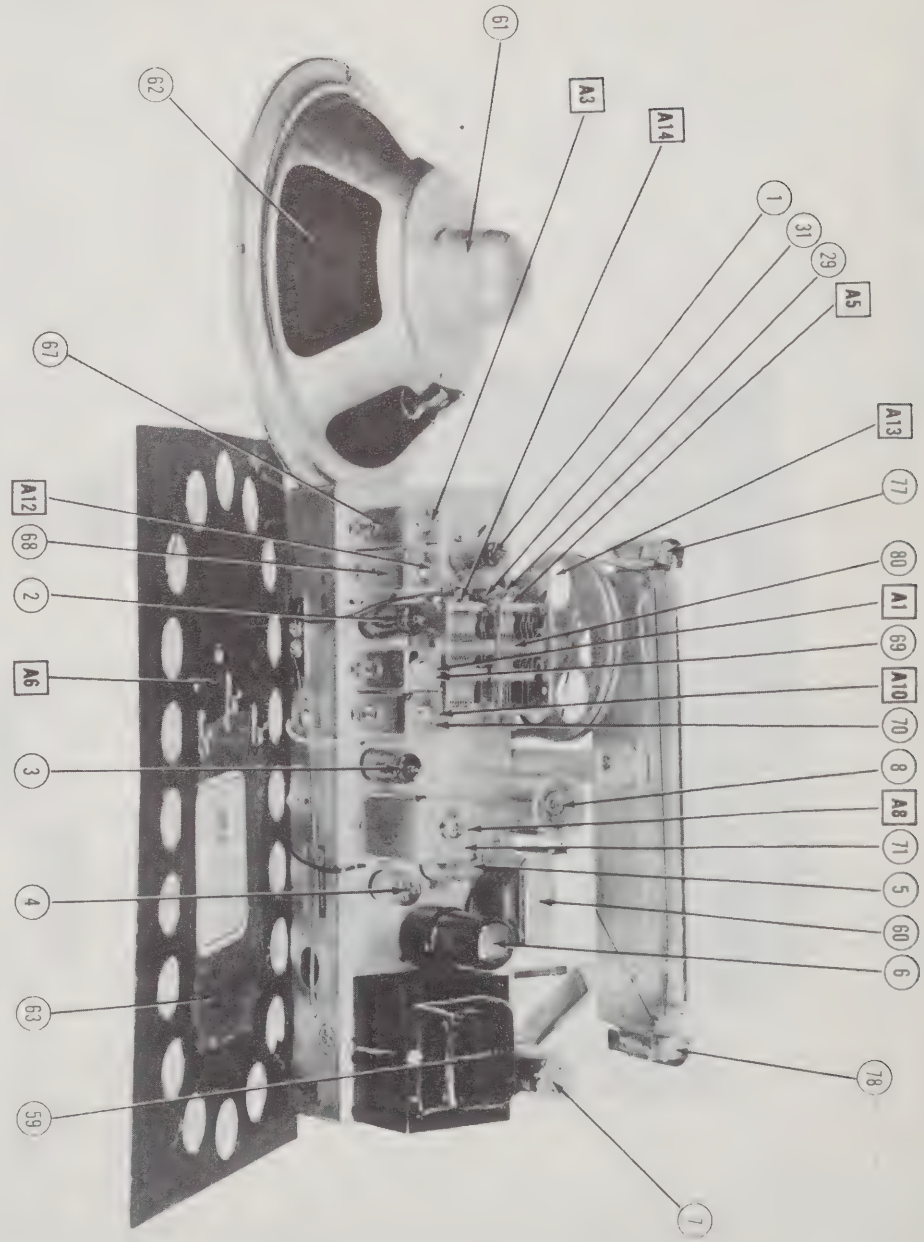
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: AIRLINE PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 36A | 500KΩ | ½ | 36X372 | D13-133X | AT-78 | Volume Control tapped @ 100KΩ |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 36A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |
| 37A | 3 Meg. | ½ | 40X285 | D13-140 | AM-67-Z | Tone Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 37A per instructions |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: AIRLINE PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 38 | 22KΩ | ½ | B84223 | BTS-22K | Red-Red-Or. Osc. Grid |
| 39 | 3900Ω | ½ | B83392 | BTS-3900 | Or.-White-Red Conv. Screen Decoup. |
| 40 | 1200Ω | ½ | B84122 | BTS-1200 | Br.-Red-Red Conv. Plate Decoup. |
| 41 | 8200Ω | 2 | D84822 | BT-2-8200 | Gray-Red-Red Bleeder |
| 42 | 68Ω | ½ | B83680 | | Blue-Gray-Blk. 1st IF Cathode |
| 43 | 1200Ω | ½ | B84122 | BTS-1200 | Br.-Red-Red 1st IF Decoup. |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

| | | | | | |
|---|---|---|---|---|---|
| 45 | 2.2 Meg. | ½ | [illegible] | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 46 | 47KΩ | ½ | ↑ | BTS-47K | Diode Filter |
| 46 | 68Ω | ½ | [illegible] | | Blue-Gray-Blk. 2nd IF Cathode |
| 47 | 1000Ω | ½ | [illegible] | BTS-1000 | Br.-Blk.-Red 2nd IF Decoup. |
| 48 | 27KΩ | ½ | [illegible] | BTS-27K | Red-Vi.-Or. De-emphasis |
| 49 | 6800Ω | ½ | [illegible] | BTS-6800 | Blue-Gray-Red Ratio Det. Diode Load-See Note 1 |
| 50 | 6800Ω | ½ | [illegible] | BTS-6800 | Blue-Gray-Red " " " " " " |
| 51 | 1 Meg. | ½ | [illegible] | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 52 | 470KΩ | ½ | [illegible] | BTS-470K | Yl.-Vi.-Yl. Series Phono |
| 53 | 15KΩ | ½ | [illegible] | BTS-15K | Br.-Grn.-Or. Tone Comp. |
| 54 | 10 Meg. | ½ | [illegible] | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 55 | 470KΩ | ½ | [illegible] | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 56 | 470KΩ | ½ | [illegible] | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 57 | 270Ω | ½ | [illegible] | BW-½-270 | Red-Vi.-Br. Output Cathode |
| 58A | 1400Ω | 6 | [illegible] | AB-1400 | Filter |
| B | 1000Ω | 4 | [illegible] | AB-1000 | " |

†Items 45 and 32A, B are one unit obtainable under Part #76X1.
Note 1-Issue "B" receivers use 15KΩ 1/2 Watt, Part No. B84153 in this application.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | AIRLINE PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 59 | 117V AC | 520V CT @ .5A. | 5.2V AC .075ADC | 6.7V AC @ 2.0A @ 2.2A | 53X290 | | T22R02‡ | |

‡Drill new mounting holes.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | AIRLINE PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 60 | 5500Ω | 3.4Ω | 475Ω | 1.1Ω | 51X134 | A-3849 | T22887 | A-2502 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | AIRLINE PART No. | JENSEN PART No. | QUAM PART No. | | |
| | FIELD. | VC IMP. | | ST-119‡ | | | ‡Replace output transformer to match 6-8Ω voice coil. |
| 61 | PM | 3.4Ω | 12A460 | Mod. P10-T | 10A31 | | |
| | CONE DIA. | VC DIA. | | | | | |
| 62 | 9" | 9/16" | | | | | |

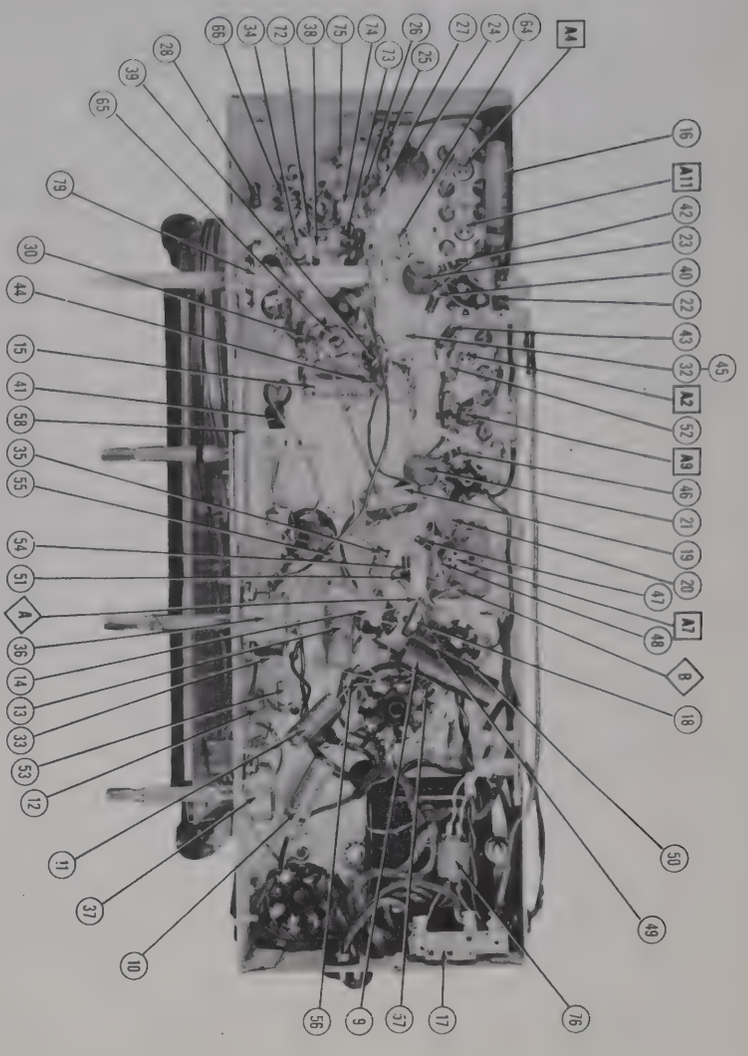
## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | AIRLINE PART No. | MEISSNER PART No. | |
| 63 | Loop Ant. | 0Ω | .9Ω | 26A478 | | |
| 64 | FM Ant.Coil | | 0Ω | 9A1956 | | |
| 65 | BC Osc.Coil | .5Ω | 5.1Ω | 9A1929 | 14-1060 | |
| 66 | FM Osc.Coil | | 0Ω | 9A1938 | | |
| 67 | AM 1st IF | 15.5Ω | 15.1Ω | 9A1934 | 16-6678 | |
| 68 | FM 1st IF | .6Ω | .1Ω | 9A1932 | | |
| 69 | AM 2nd IF | 14.8Ω | 14.8Ω | 9A1935 | 16-6678 | |
| 70 | FM 2nd IF | .6Ω | .1Ω | 9A1933 | | |
| 71 | FM Disc. Trans. | .9Ω | .1Ω | 9A1936 | | |
| 72 | Choke | | 0Ω | 9A1940 | | Item 72 is wound on a 10Ω 1/4W. resistor |
| 73 | " | | 0Ω | | | Item 73 is wound on a 10Ω 1/4W. resistor |
| 74 | Plate Choke | | .3Ω | 9A1882 | | |
| 75 | Fil. Choke | | .3Ω | 9A1882 | | |
| 76A | Line. Choke | | 0Ω | 9A1930 | | |
| B | " " | | 0Ω | | | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | AIRLINE PART No. | | |
| 77 | Bayonet | 6-8 | 0.15 | Brown | 7A103 | | Type 47 |
| 78 | " | 6-8 | 0.15 | " | 7A103 | | " " |

## CHASSIS—BOTTOM VIEW




# PARTS LIST AND DESCRIPTIONS (Continued)

## MISCELLANEOUS

| ITEM No. | PART NAME | AIRLINE PART No. | NOTES |
|---|---|---|---|
| 79 | Switch | 2A375 | Band-Phono |
| 80 | Tuning Gang | 14A-204 | (40-540MMF, 45-225MMF) |
| A6 | Trimmer | 17A235 | BC Ant. Adj. |
| A13 | " | 26A489 | FM Osc. Adj. |
| | Dial Glass | 58X699 | |
| | Dial Pointer | 15X241 | |

FIG. 1

FIG. 2

FOR AM ALIGNMENT SEE FRONT PAGE OF THIS FOLDER.

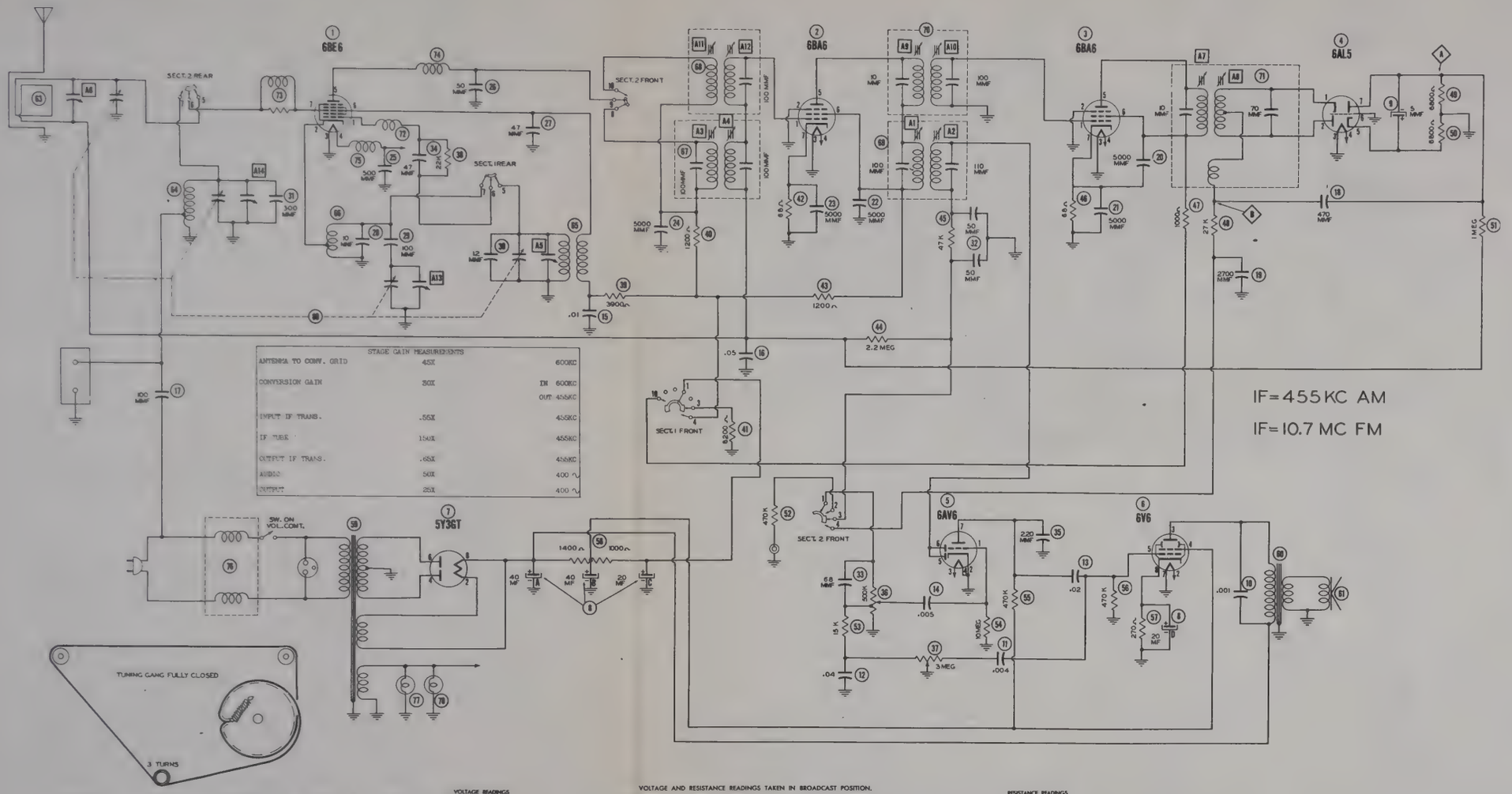
## FM ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5 | .01 MFD | High side to Pin 1 (grid) of 6BA6 2nd IF Tube (3). Low side to chassis. | 10.7MC (Unmodulated) | FM (fully clockwise) | Tuning cap. fully open. | DC probe ⊕ to Point ⊖ to Common to chassis | A7 | Adjust for maximum deflection. |
| 6 | " | High side to Pin 1 (grid) of 6BA6 1st IF Tube (2). Low side to chassis. | " | " | " | DC probe ⊕ to Point ⊖ to Common to chassis | A9,A10 | Use a zero center scale VTVM if available. Adjust for zero deflection. Repeat Steps 5 and 6 until no further improvement can be made. Maximum deflection, Attenuate output or sig. gen. to give same maximum reading as obtained in Step 5. |
| 7 | " | High side to Pin 7 (grid) of 6BE6 Low side to chassis. | " | " | " | DC probe ⊕ to Point ⊖ to Common to chassis | A11,A12 | |
| 8 | 300Ω carbon res. | Disconnect line from FM ant. High side of sig. gen. to ungrounded FM ant. terminal Low side to chassis. | 108.5MC (Unmodulated) | " | " | " | A13 | Adjust for maximum deflection. |
| 9 | " | " | 104.5MC (Unmodulated) | " | Tune for maximum deflection. | " | A14 | Rock tuning cap. and adjust for maximum deflection. Repeat Steps 9 & 10 until no further improvement can be made. |
| 10 | " | " | " | " | " | " | " | |

FM ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5 | .01 MFD | High side to Pin 1 (grid) of 6BA6 1st IF Tube (3). Low side to chassis. | 10.7MC (Freq. Mod.) | FM | Tuning cap. fully open. | Vertical ⊕ to Point ⊖ to Ground to chassis. | A7,A10 A9 | Disconnect 5 MFD cap. Adjust A7, A10 and A9 for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 6 | .01 MFD | Disconnect lead from Pin 7 (grid) of 6BE6 and connect common end of 100Ω resistor from Pin 7 to chassis making leads as short as possible. High side of sig. gen. to Pin 7. Low side to chassis. | " | " | " | " | A12,A11 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 7 | .01 MFD | Remove 100Ω resistor from Step 6. Reconnect Pin 7. Disconnect Pin 1 of 6BA6 1st IF Tube (3). Low side to chassis. | " | " | " | Vertical ⊕ to Point ⊖ to Ground to chassis. | A8 | Reconnect 5 MFD cap. to Point ◇. Adjust A8 for maximum brightness or crossover occurring at center of pattern per Fig. 2. |
| 8 | 300Ω carbon res. | Disconnect line from FM ant. High side of sig. gen. to ungrounded FM ant. terminal Low side to chassis. | 108.5MC (Freq. Mod.) | " | " | " | A13 | Disconnect 5 MFD cap. from Point ◇. Adjust A13 for coincidence of pattern per Fig. 1. |
| 9 | " | " | 104.5MC (Freq. Mod.) | " | Tune for coincidence. | " | A14 | Adjust for maximum amplitude of pattern per Fig. 1. Repeat Steps 8 & 9 until no further improvement can be made. Reconnect 5 MFD cap. to Point ◇. |




VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BE6 | -7VDC‡ | 0V. | 0V. | 6.7VAC | 140VDC | 115VDC | 0V. | - |
| 2 | 6BA6 | -.2V3C | 0V. | 0V. | 6.7VAC | 125VDC | 1.5VDC | 1.2VDC | - |
| 3 | 6BA6 | 0V. | 0V. | 0V. | 6.7VAC | 120VDC | 120VDC | 1.2VDC | - |
| 4 | 6AL5 | -2VDC | .2VDC | 0V. | 6.7VAC | .8VDC | 0V. | -.3VDC | - |
| 5 | 6AV6 | -.7VDC | 0V. | 0V. | 6.7VAC | -.5VDC | -.5VDC | 75VDC | - |
| 6 | 6V6GT | 0V. | 6.7VAC | 240VAC | 200VDC | 0V. | 0V. | 0V. | 8.5VDC |
| 7 | 5Y3GT | 0V. | 260VDC | 0V. | 260VAC | 0V. | 260VAC | 0V. | 260VDC |

‡TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BE6 | 22KΩ | 0Ω | 0Ω | .1Ω | 10KΩ | 12KΩ | 700KΩ | - |
| 2 | 6BA6 | 1 Meg. | 0Ω | 0Ω | .1Ω | 10KΩ | 10KΩ | 68Ω | - |
| 3 | 6BA6 | .1Ω | 0Ω | 0Ω | .1Ω | 70KΩ | 70KΩ | 68Ω | - |
| 4 | 6AL5 | 520KΩ | 520KΩ | 0Ω | .1Ω | 6.8KΩ | INF. | 6.8KΩ | - |
| 5 | 6AV6 | 10 Meg. | 0Ω | 0Ω | .1Ω | 550KΩ | 550KΩ | 440KΩ | - |
| 6 | 6V6GT | INF. | .1Ω | 10KΩ | 10KΩ | 470KΩ | .5Ω | 0Ω | 270Ω |
| 7 | 5Y3GT | INF. | 10KΩ | INF. | 100Ω | INF. | 110Ω | INF. | 10KΩ |

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

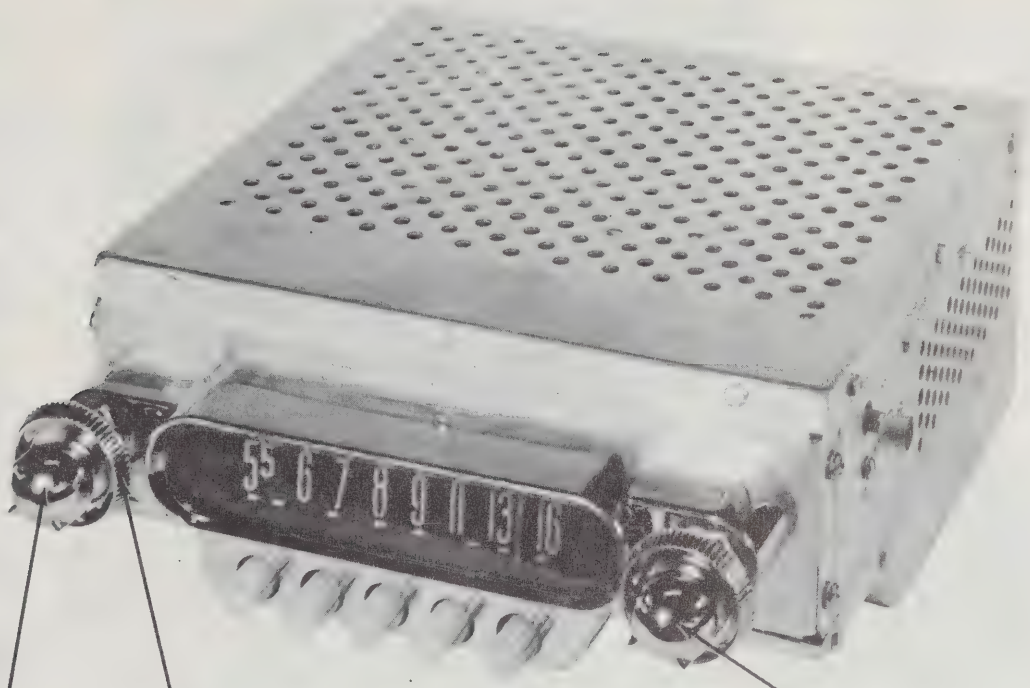
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1948

FORD MODEL
M-1 (8A-18805A)




FORD MODEL
M-1 (8A-18805A)

FORD MODEL M-1

| | |
|---|---|
| TRADE NAME | Ford, Model M-1 (8A-18805-A) |
| SUPPLIER | Ford Motor Car Co., Detroit, Mich. |
| TYPE SET | Battery Operated Custom Built Automotive Superheterodyne Receiver |
| TUBES (SIX) | Types, 6SK7GT RF Amp., 6SA7GT Converter, 6SK7GT IF Amp., 6SQ7GT Det.-AVC-AF, 6V6GT Power Output, 6X5GT Rectifier. |
| POWER SUPPLY | 6 Volt Storage Battery |
| TUNING RANGE—BROADCAST | 540-1610KC RATING .645 Amp. @ 7.2 Volts DC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If sig. gen. does not have sufficient output to force IF signal through the RF stage it may be connected to Pin 8 (grid) of 6SA7.

Make all alignment adjustments to this receiver with "A" lead connected to a 7.2VDC negative source, and ground the chassis to the positive side of this source. Rotate the volume and tone controls to their maximum clockwise position. Use an insulated screwdriver for all adjustments.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to ant. socket. Low side to chassis. (See pre-alignment notes.) | 262.5KC | High freq. end (Cores completely out of coils.) | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output and repeat. |
| 2 | 60MMFD. | High side to ant. socket. Low side to chassis. | " | " | " | A5 | Adjust for minimum output. |
| 3 | 60MMFD. | " | 1610KC | " | " | A6,A7, A8 | Adjust for maximum output. |
| | The following steps are necessary only when a core or coil form has been replaced. If they are unnecessary continue with Step 6. | | | | | | |
| 4 | 60MMFD. | High side to ant. socket. Low side to chassis. | 1400KC | 1400KC | Across voice coil | A9,A10, A11 | Adjust for maximum output. |
| 5 | 60MMFD. | " | 600KC | Tune for maximum output. | " | A12 | Rock tuning cap. and adjust for maximum output. Repeat Steps 3, 4 & 5 until no further improvement can be made. Secure core adjustments with speaker cement. |
| 6 | With receiver installed in car and antenna fully extended, tune in weak station near 1400KC and adjust A8 for maximum volume. | | | | | | |

HOWARD W. SAMS & CO., INC. • [illegible] • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc."
Printed in U. S. of America

DATE 9/48-#4816-4 SET #46-FOLDER #4

# PARTS LIST AND DESCRIPTIONS

FORD MODEL M-1

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6SK7GT | 6SK7GT | 8N | |
| 2 | Converter | 6SA7GT | 6SA7GT | 8AD | |
| 3 | IF Amp. | 6SK7GT | 6SK7GT | 8N | |
| 4 | Det.-AVC-AF | 6SQ7GT | 6SQ7GT | 8Q | |
| 5 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 6 | Rectifier | 6X5GT | 6X5GT | 6S | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: BENDIX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 7A | 20 | 350 | H161-3002 | AF32K4A | UP1145C | DY2x20-350 | EL212 | ■ Filter |
| B | 10 | 300 | | | | M-25-25 | | ▲ " |
| C | 20 | 25 | | | | | | Cathode Bypass |
| 8 | .5 | 100 | H169-0001 | | DT2P5 | SHH-1 | | Hash Filter |
| 9 | .5 | 100 | H169-0001 | | DT2P5 | SHH-1 | | " " |
| 10 | .5 | 100 | H169-0001 | | DT2P5 | | | " " |
| 11A | .008 | 1000 | H169-0005 | | MD16D8 | | | Buffer |
| B | .008 | 1000 | | | MD16D8 | | | " |
| 12 | .004 | 600 | H162-0624 | 684-.004 | DT6D4 | ST-6-004 | TC-24 | Output Plate Bypass |
| 13 | .02 | 200 | H162-0612 | 484-.02 | DT2S2 | ST-4-02 | TC-12 | Tone Comp. |
| 14 | .003 | 600 | H162-0623 | 684-.003 | DT6D3 | ST-6-003 | TC-23 | " " |
| 15 | .03 | 400 | H162-0413 | 434-.03 | DT4S3 | ST-6-03 | TC-13 | Audio Coupling |
| 16 | .01 | 200 | H162-0611 | 484-.01 | DT2S1 | ST-4-01 | TC-11 | " " |
| 17 | .1 | 200 | H162-0601 | 484-.1 | DT2P1 | ST-2-1 | TC-1 | IF Cathode Bypass |
| 18 | .1 | 400 | H162-0601 | 434-.1 | DT4P1 | ST-4-1 | TC-1 | Screen Decoupling |
| 19 | .1 | 200 | H162-0601 | 484-.1 | DT2P1 | ST-2-1 | TC-1 | RF Cathode Bypass |
| 20 | .05 | 200 | H162-0615 | 484-.05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 21 | .004 | 600 | H162-0624 | 684-.004 | DT6D4 | ST-6-004 | TC-24 | Ant. Coupling |
| 22 | 330 | 300 | H166-0330 | 1468-.0003 | 5W5T3 | MO.5-33 | 1FM-33 | RF Bypass-Cer. |
| 23 | 330 | 500 | H166-0330 | 1468-.0003 | 5W5T3 | MO.5-33 | 1FM-33 | AF Plate Bypass-Cer. |
| 24 | 100 | 500 | H166-0100 | 1468-.0001 | 5W5T1 | MO.5-31 | 1FM-31 | RF Coupling |
| 25 | 15 | 300 | H166-0015 | | | | MS-415 | Fixed Trimmer 10%-Cer. |
| 26 | 270 | 200 | H164-0270 | | | | " | " |
| 27 | 100 | 300 | H166-0100 | 1469-.0001 | 5R5T1 | MOS.5-31 | MS-31 | Osc. Grid Cap.-Cer. |
| 28 | 470 | 300 | H169-0004 | | | | | Fixed Trimmer 3%-Cer. |
| 29 | 100 | 300 | H166-0100 | 1469-.0001 | 5R5T1 | MOS.5-31 | MS-31 | " " 10%- " |

## CONTROLS

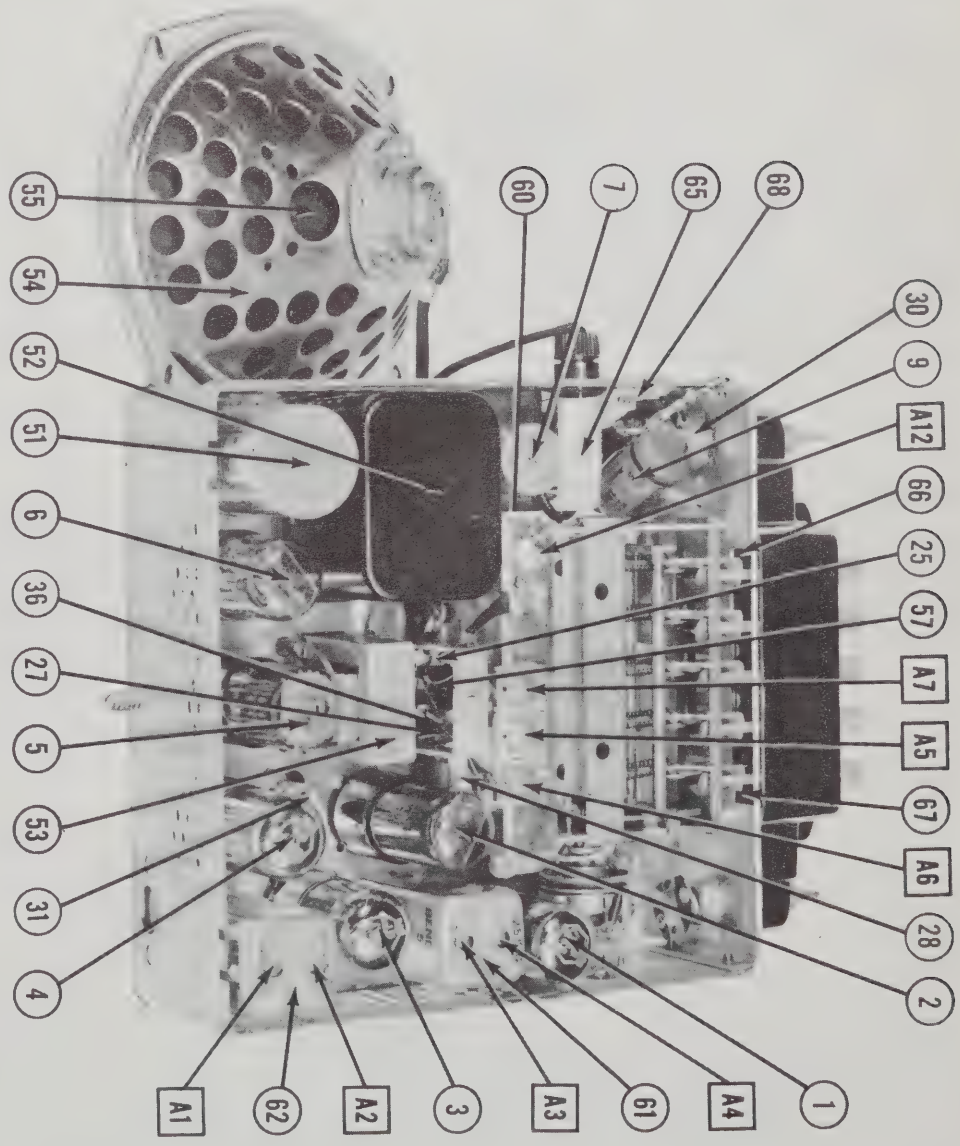
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: BENDIX PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 30A | 250KΩ | ½ | H159-0003 | | | Volume Control & Sw. tapped @ 75KΩ |
| B | 1 Meg. | ½ | | | | Tone Control-See Note |
| 31 | 900Ω | 1 | H159-0002 | | | Sensitivity Control |

Note-Item 30A & 30B is a dual control operated by a concentric shaft.

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: BENDIX PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 32 | 1 Meg. | ½ | H181-0105 | BTS-1 Meg. | Br.-Blk.-Grn. RF Grid |
| 33 | 150Ω | ½ | H181-0151 | BW-½-150 | Br.-Grn.-Br. RF Cathode |
| 34 | 10KΩ | 2 | H183-0103 | BT-2-10K | Br.-Blk.-Or. RF Plate Load |
| 35 | 470KΩ | ½ | H181-0474 | BTS-470K | Yl.-Vi.-Yl. Conv. Grid |
| 36 | 22KΩ | ½ | H181-0223 | BTS-22K | Red-Red-Or. Osc. Grid |
| 37 | 15KΩ | 2 | H183-0153 | BT-2-15K | Br.-Grn.-Or. Screen Dropping |
| 38 | 1 Meg. | ½ | H181-0105 | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 39 | 10 Meg. | ½ | H181-0106 | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 40 | 330KΩ | ½ | H181-0334 | BTS-330K | Or.-Or.-Yl. AF Plate Load |
| 41 | 12KΩ | ½ | H181-0123 | BTS-12K | Br.-Red-Or. Tone Comp. |
| 42 | 470KΩ | ½ | H181-0474 | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 43 | 270Ω | 1 | H182-0271 | BW-1-270 | Red-Vi.-Br. Output Cathode |
| 44 | 1500Ω | 2 | H183-0152 | BT-2-1500 | Br.-Grn.-Red Filter |
| 45 | .3Ω | 2 | H189-0003 | | Or.-Blk.-Silver Fil. Dropping-See Note |
| 46 | 10Ω | 1 | H182-0100 | BW-1-10 | Br.-Blk.-Blk. Series Dial Light |
| 47 | 10Ω | 1 | H182-0100 | BW-1-10 | Br.-Blk.-Blk. " " " |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | BENDIX PART No. | IRC PART No. | |
| 48 | 1Ω | 1 | H189-0004 | BW-1-1 | Br.-Blk.-Gold Fil. Dropping |
| 49 | 82Ω | ½ | H181-0820 | BW-½-82 | Gray-Red-Blk. Hash Supp. |
| 50 | 82Ω | ½ | H181-0820 | BW-½-82 | Gray-Red-Blk. " " |

Note-On IRC replacement parallel a .56Ω 1W and a .68Ω 1W to obtain .31Ω at 2 watts.

## VIBRATOR

| ITEM No. | TYPE | INPUT VOLTS | FREQUENCY | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | | BENDIX PART No. | RADIART PART No. | |
| 51 | Interrupter | 6.7 VDC | 115~ | H-511-0001 | 5301 | |

## TRANSFORMER (VIBRATOR)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | BENDIX PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 52 | 6.8V DC @ 3.75A | 650V CT @ .06A | | | H141-0004 | | | |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | BENDIX PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 53 | 4100Ω | 3.1Ω | 565Ω | .6Ω | H143-0003 | A-3877# | T22846# | A-2230# | #Solder to chassis. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | BENDIX PART No. | JENSEN PART No. | QUAM PART No. | |
| | FIELD | VC IMP. | | | | |
| 54 | PM | 3.1Ω | H539-0001 | | 69A3 | |
| | CONE DIA. | VC DIA. | | | | |
| 55 | 6"x9" | 3/4" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | BENDIX PART No. | MEISSNER PART No. |
| 56 | Ant. Coil | | 11Ω | H112-0002 | |
| 57 | Wave Trap | | 46Ω | H118-0001 | |
| 58 | RF Coil | | 14Ω | H112-0002 | |
| 59 | Osc. Coil | | 2.5Ω | H113-0005 | |
| 60 | Osc. Shunt Coil | | 3Ω | H116-0001 | |
| 61 | Input IF | 60Ω | 60Ω | H121-0004 | 16-6662 |
| 62 | Output IF | 45Ω | | H122-0004 | |
| 63 | Ant. Choke | | 1Ω | H148-0004 | |
| 64 | Hash Choke | | 0Ω | H147-0007 | |
| 65 | " " | | 0Ω | H147-0002 | |

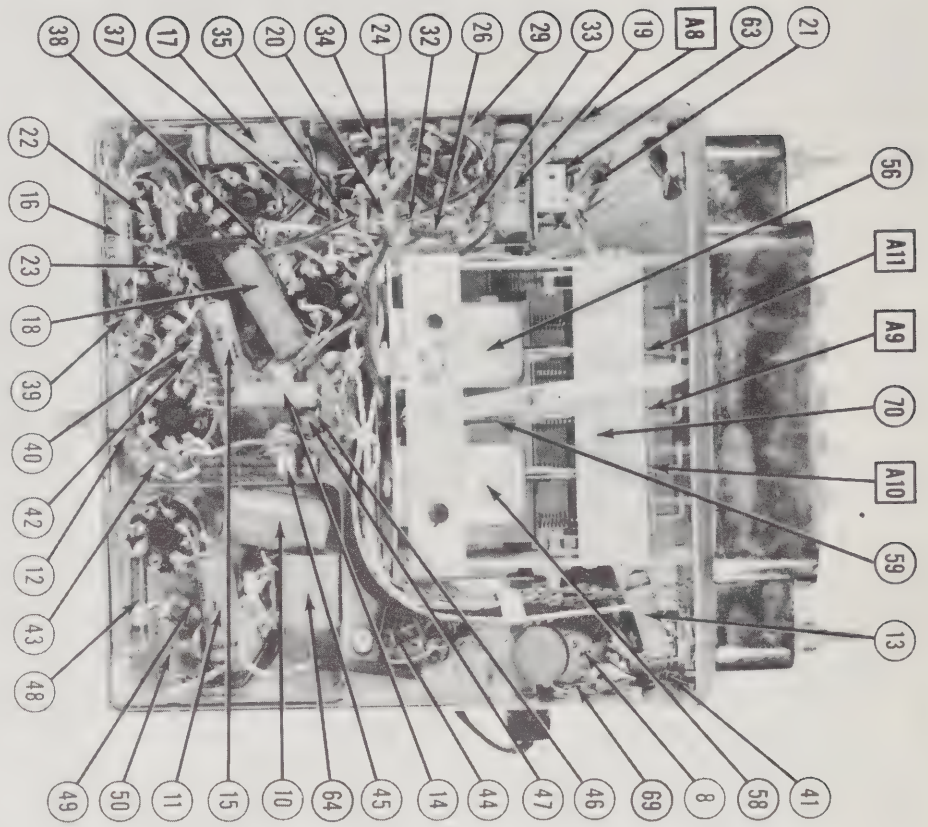
## DIAL LIGHT

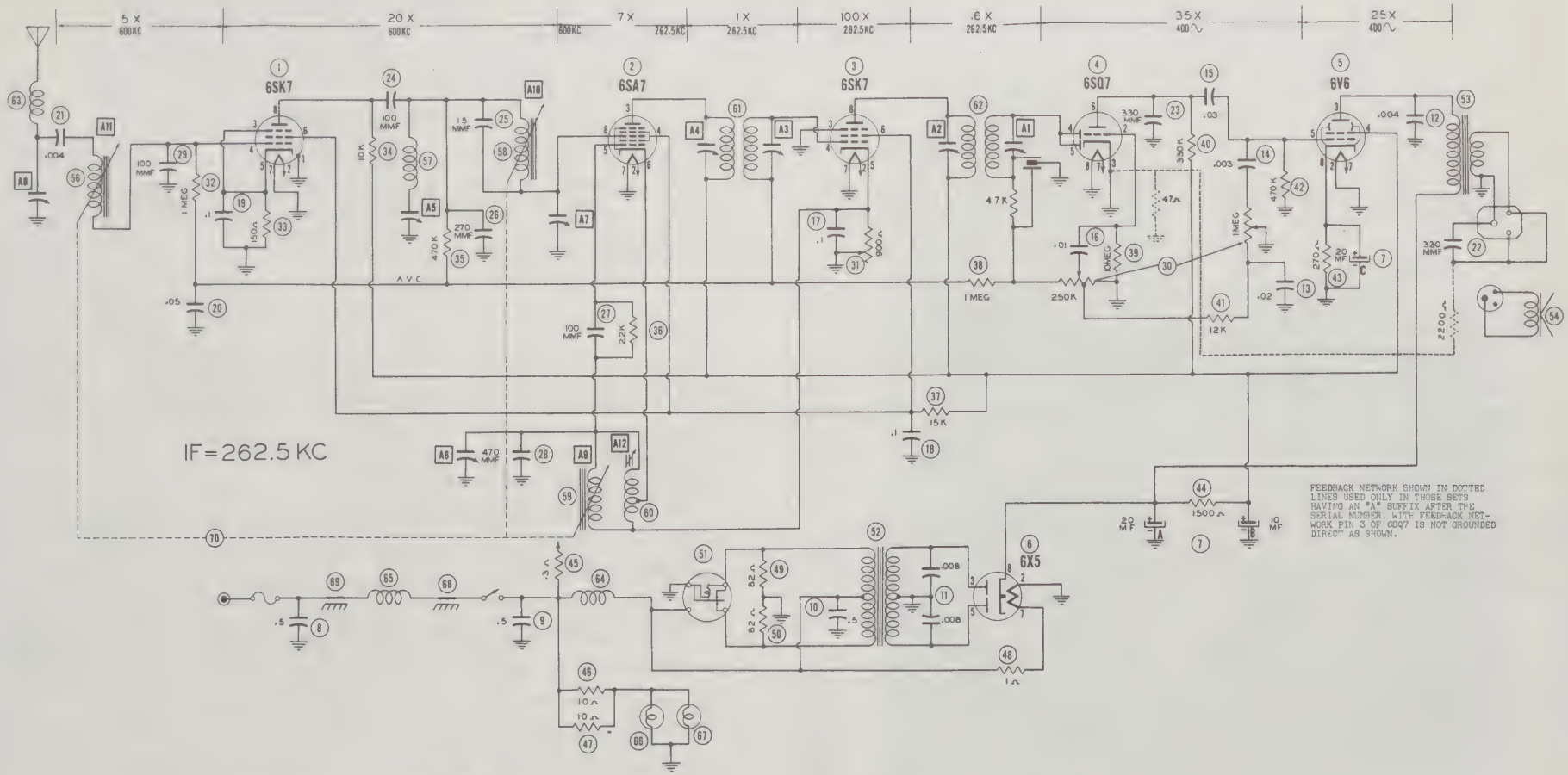
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | BENDIX PART No. | | |
| 66 | Bayonet | 6-8 | 0.25 | Blue | H611-0044 | | Type #44 |
| 67 | " | 6-8 | 0.25 | " | H611-0044 | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | BENDIX PART No. | NOTES |
|---|---|---|---|
| 68 | Spark Plug | H167-0004 | |
| 69 | " " | H167-0004 | |
| 70 | Tuning Assby. | | |
| A5 | Trimmer | H172-0012 | Wave Trap Adj. |
| A6 A7 | Trimmer Strip | H172-0011 | Osc. Adj. RF Adj. |
| A8 | Trimmer | H172-0010 | Ant. Adj. |
| | Dial | H722-0003 | |

# CHASSIS—BOTTOM VIEW




5 X 600KC
20 X 600KC
7 X 600KC
1 X 262.5KC
100 X 262.5KC
.6 X 262.5KC
35 X 400~
25 X 400~
1 6SK7
2 6SA7
3 6SK7
4 6SQ7
5 6V6
6 6X5
A.V.C.
IF = 262.5 KC
FEEDBACK NETWORK SHOWN IN DOTTED LINES USED ONLY IN THOSE SETS HAVING AN "A" SUFFIX AFTER THE SERIAL NUMBER. WITH FEED-BACK NETWORK PIN 3 OF 6SQ7 IS NOT GROUNDED DIRECT AS SHOWN.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SK7GT | 0V. | -6.6VDC | 1.2VDC | -.1VDC | 1.2VDC | 75VDC | 0V. | 160VDC |
| 2 | 6SA7GT | 0V. | -6.6VDC | 230VDC | 75VDC | -7.4VDC | 3.4VDC | 0V. | -.1VDC |
| 3 | 6SK7GT | 0V. | -6.6VDC | 0V. | -.1VDC | 3.4VDC | 75VDC | 0V. | 230VDC |
| 4 | 6SQ7GT | 0V. | -.4VDC | 0V. | -.4VDC | -.4VDC | 105VDC | -6.6VDC | 0V. |
| 5 | 6V6GT | 0V. | 0V. | 250VDC | 230VDC | 0V. | 0V. | -6.6VDC | 11VDC |
| 6 | 6X5GT | 0V. | 0V. | 325VAC | 0V. | 325VAC | 0V. | -6.6VDC | 270VDC |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SK7GT | 0Ω | .1Ω | 15KΩ | 2.2 Meg. | 150Ω | 120KΩ | 0Ω | 110KΩ |
| 2 | 6SA7GT | 0Ω | .1Ω | 100KΩ | 120KΩ | 22KΩ | .06Ω | 0Ω | 1.5 Meg. |
| 3 | 6SK7GT | 0Ω | .1Ω | 0Ω | 1.3 Meg. | 900Ω | 120KΩ | 0Ω | 10KΩ |
| 4 | 6SQ7GT | 0Ω | 10 Meg. | 0Ω | 300KΩ | 300KΩ | 430KΩ | .1Ω | 0Ω |
| 5 | 6V6GT | 0Ω | 0Ω | 100KΩ | 100KΩ | 470KΩ | INF. | .1Ω | 270Ω |
| 6 | 6X5GT | INF. | 0Ω | 330Ω | 0Ω | 310Ω | INF. | .1 | 100KΩ |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

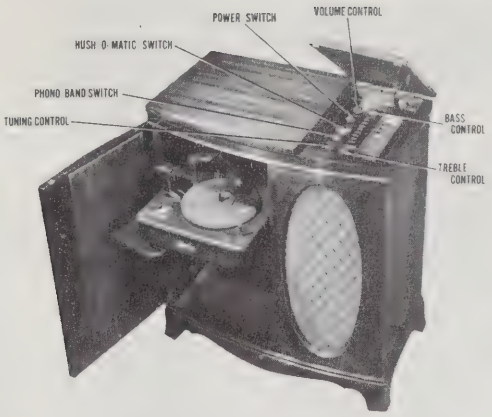
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1948

4816-4

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 7.2 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.




BENDIX MODEL 1217D

| | |
|---|---|
| TRADE NAME | Bendix, Model 1217D |
| MANUFACTURER | Bendix Radio Div. of Bendix Aviation Corp., Baltimore, Md. |
| TYPE SET | AC Operated Combination Phono-Radio, 2 Band AM-FM Superheterodyne Receiver |
| TUBES (FOURTEEN) | Types, 6AG5 RF Amp., 7F8 FM Converter, 6BE6 AM Converter, 7AH7 1st IF Amp., 7AH7 2nd IF Amp., 6H6 Det.-AVC, 6H6 FM Det., 6SN7GT FM Pre-Amp.-1st Audio, 6AQ6 Phono Pre-Amp., 6BA6 Reactance, 6SN7GT Phase Inv., (2) 6V6GT Power Output, 5U4G Rectifier. |
| POWER SUPPLY | 110-120 Volts AC RATING 1.13 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1620KC SHORT WAVE 5.7-16MC FREQ. MOD. 88-108MC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The AM calibration marks are at the bottom of the dial glass
Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

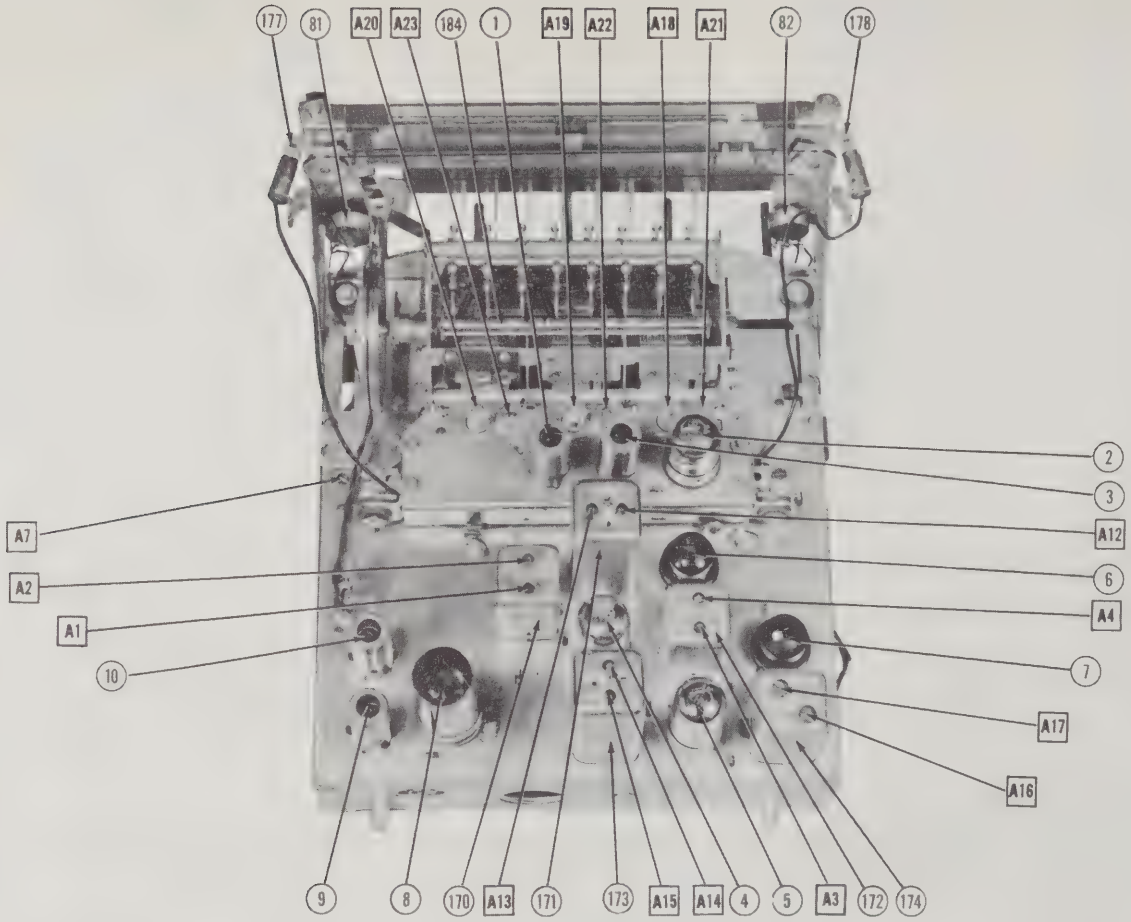
**AM ALIGNMENT**

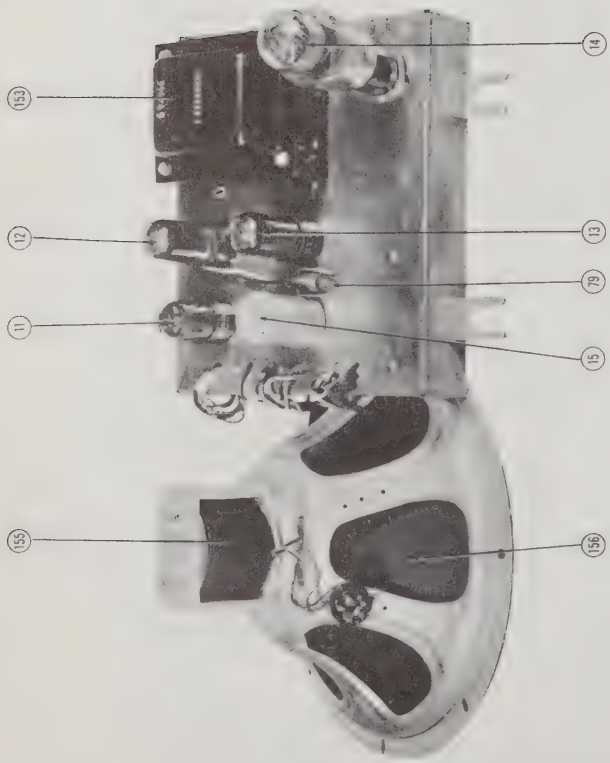
| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .05 MFD. | High side to center "AM" stator of tuning cap. Low side to chassis. | 455KC | BC (1 position counter-clockwise) | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output |
| 2 | Connect 3.7 micro-henry choke across loop jacks. | High side through .01 MFD cap. to loop jack, (with yellow lead). Low side to loop jack (with green lead). | 580KC | " | 580KC | " | A5 | " " " " |
| 3 | " | " | 1475KC | " | 1475KC | " | A6,A7, A8 | " " " " |
| 4 | " | " | 580KC | " | Tune for maximum output. | " | A5 | Rock tuning cap. and adjust for maximum output. Repeat Steps 3 and 4 until no further increase in output can be obtained. Check calibration at 580 and 965KC. If not within limits "knife" plates of tuning cap. |
| 5 | 400Ω carbon res. | High side to blue lead of FM ant. socket. Low side to chassis. | 15MC | SW (fully clockwise) | 15MC | " | A9 | Adjust for maximum output. Tune signal generator to 14.1MC. If no signal is heard A9 is adjusted correctly. If a signal is heard retune signal generator to 15MC and loosen A9 until next peak is heard. Adjust for maximum output and re recheck for image. |
| 6 | " | " | " | " | Tune for maximum output. | " | A10, A11. | Rock tuning cap. and adjust for maximum output. |

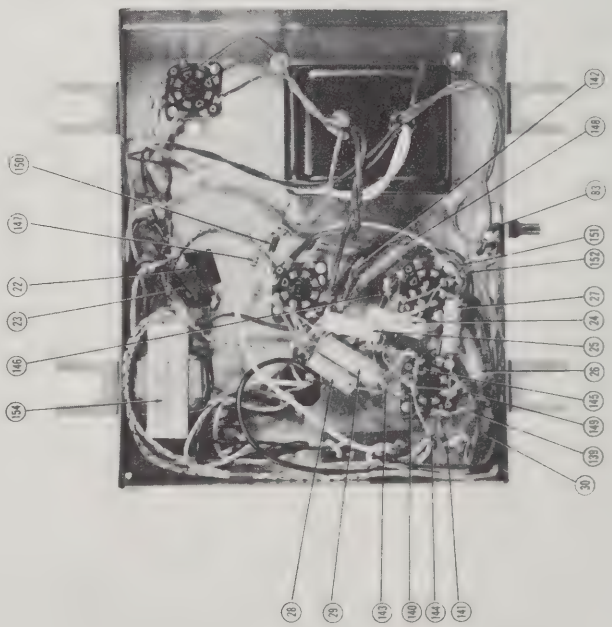
FOR FM ALIGNMENT SEE REAR PAGE

HOWARD W. SAMS & CO., INC. • • Indianapolis , Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


177
81
A20
A23
184
1
A19
A22
A18
A21
82
178
2
3
A12
6
A4
7
A17
A16
A7
A2
A1
10
9
8
170
A13
171
173
A15
A14
4
5
A3
172
174


14
153
13
12
79
11
15
155
156


142
148
150
33
147
151
152
22
27
23
24
25
146
26
145
154
149
139
30
29
31
143
144
141

**BENDIX MODEL 1217D**

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6AG5 | 6AG5 | 7LD | |
| 2 | FM Converter | 7F8 | 7F8 | 9BW | |
| 3 | AM Converter | 6BE6 | 6BE6 | 7CH | |
| 4 | 1st IF Amp. | 7AH7 | 7AH7 | | |
| 5 | 2nd IF Amp. | 7AH7 | 7AH7 | | |
| 6 | Det.-AVC | 6H6 | 6H6 | 7Q | |
| 7 | FM Det. | 6H6 | 6H6 | 7Q | |
| 8 | FM Pre-Amp.-1st Audio | 6SN7GT | 6SN7GT | 9BD | |
| 9 | Phono Pre-Amp. | 6AQ6 | 6AQ6 | 7BT | |
| 10 | Reactance | 6BA6 | 6BA6 | 7BK | |
| 11 | Phase Inv. | 6SN7GT | 6SN7GT | 9BD | |
| 12 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 13 | " " | 6V6GT | 6V6GT | 7AC | |
| 14 | Rectifier | 5U4G | 5U4G | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: BENDIX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 15A | 20 | 450 | CE2A02 | AF444J* | UP1111451 | DY-3x20-450* | EL-330* | ▲ Filter |
| B | 20 | 450 | | | | | | ▲ " |
| 16A | 16 | 450 | CE2D00 | PRSA450/8-16 | EDL8145 | DH-816-450SS | UT-816 | " - Red |
| B | 8 | 450 | | | | | | " - Blue |
| 17 | 20 | 25 | CE1T02 | PRS25/25 | BR202A | M-25-25 | TA-25 | Cathode Bypass |
| 18 | 10 | 50 | | PRS50/10 | BR105 | M-10-50 | TA-510 | " " |
| 19 | 3 | 50 | CE1D00 | PRS150/4 | BR415 | M-4-450 | UT-41 | Stabilizing Cap. |
| 20 | 20 | 25 | CE1T02 | PRS25/25 | BR202A | M-25-25 | TA-25 | Ratio Det. Bias Filter |
| 21 | 3 | 50 | | PRS150/4 | BR415 | M-4-450 | UT-41 | Limiter Filter |
| 22 | .01 | 400 | CP4M01 | 484-01 | DT4S1 | MPH-4-01 | TC-11 | Line Filter |
| 23 | .01 | 400 | CP4M01 | 484-01 | DT4S1 | MPH-4-01 | TC-11 | " " |
| 24 | .01 | 400 | CP4T31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Output Plate Bypass |
| 25 | .01 | 400 | CP4T31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | " " " |
| 26 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Feedback |
| 27 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Audio Coupling |
| 28 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | " " |
| 29 | .1 | 400 | CP4T01 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | Hum Balancing |
| 30 | .05 | 500 | CP2T40 | 484-05 | DT2S5 | ST-4-05 | TC-15 | Cathode Bypass |
| 31 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Audio Coupling |
| 32 | .02 | 400 | CP4T34 | 484-02 | DT4S2 | ST-4-02 | TC-12 | Tone Comp. |
| 33 | .002 | 600 | CP6T12 | 684-002 | DT6D2 | ST-6-002 | TC-22 | " " |
| 34 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Feedback |
| 35 | .03 | 600 | CP4T36 | 684-03 | DT6S3 | ST-6-03 | TC-13 | Audio Coupling |
| 36 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | " " |
| 37 | .01 | 400 | CP4T31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | AVC Filter |
| 38 | .1 | 400 | CP4T51 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | Pre-Amp. Cathode Bypass |
| 39 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Reactance Bias Filter |
| 40 | .03 | 200 | CP2T36 | 484-03 | DT4S3 | ST-4-03 | TC-13 | Reactance Screen Byp. |
| 41 | .006 | 400 | CP4T20 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Audio Coupling |
| 42 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Decoupling |
| 43 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 2nd IF Decoupling |
| 44 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 2nd IF Screen Bypass |
| 45 | .01 | 400 | CP0M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 2nd IF Cathode Bypass |
| 46 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 1st IF Decoupling |
| 47 | .01 | 400 | CP0M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | AVC Filter |
| 48 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Conv. Screen Byp. |
| 49 | .01 | 400 | CP4T31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Bypass Power Supply |
| 50 | .01 | 400 | CP0M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | AVC Filter |
| 51 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | FM Conv. Plate Decoup. |
| 52 | .01 | 400 | CP4T31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Plate Decoupling |
| 53 | .01 | 400 | CP4M31 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Screen Bypass |
| 54 | 150 | 500 | CM5A26 | 1468-00015 | 5W5T15 | MO.5-315 | 1FM-315 | AF Plate Bypass |
| 55 | 22 | 500 | CM5A05 | | 5W5Q2 | MO.5-42 | MS-42 | Feedback |
| 56 | 1000 | 300 | CC5K50 | 1468-001 | 1W5D1 | MO.3-21 | 1FH-21 | Phono Coupling-Cer. |
| 57 | 68 | 500 | CC5A22 | 1468-000075 | 5W5Q7 | MO5.5-47 | MS-47 | Audio Coupling |
| 58 | 10 | 500 | CC5A22 | 1468-00001 | 5W5Q1 | MO.5-41 | MS-41 | Quadrature Network |
| 59 | 150 | 500 | CM5A26 | 1468-00015 | 5W5T15 | MO.5-315 | 1FM-315 | RF Bypass |
| 60 | 330 | 500 | CM5A34 | | | | | Diode Load Cap.-See Note |
| 61 | 330 | 500 | CM5A34 | | | | | " " " " " |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 110 | 220K | ½ | RC22A224K | BTS-220K | Red-Red-Yl. Delayed AVC Network |
| 111 | 100 | ½ | RC22A102K | BTS-1000 | Br.-Blk.-Red Balancing Resistor |
| 112 | 33M | ½ | RC22A333M | BTS-33K | Or.-Or.-Or. Ratio Det. Diode Load |
| 113 | 10K | ½ | RC24A103M | BTS-10K | Br.-Blk.-Or. Delayed AVC Network |
| 114 | 2.2 Meg. | ½ | RC22A225M | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 115 | 330KΩ | ½ | RC22A334M | BTS-330K | Or.-Or.-Yl. Phono Shunt |
| 116 | 1 Meg. | ½ | RC22A105M | BTS-1 Meg. | Br.-Blk.-Grn. Phono Pre-Amp. Grid |
| 117 | 220K | ½ | RC22A224M | BTS-220K | Red-Red-Yl. Phono Pre-Amp. Plate Load |
| 118 | 6800Ω | ½ | RC22A682M | BTS-6800 | Blue-Gray-Red Phono Pre-Amp. Cathode |
| 119 | 3.3 Meg. | ½ | RC22A335M | BTS-3.3 Meg. | Or.-Or.-Grn. Bias Rect. Diode Load |
| 120 | 220KΩ | ½ | RC22A105M | BTS-220K | Red-Red-Yl. Phono Tone Comp. |
| 121 | 3.3 Meg. | ½ | RC22A335M | BTS-3.3 Meg. | Or.-Or.-Grn. Reactance Bias Network |
| 122 | 3.3 Meg. | ½ | RC22A335M | BTS-3.3 Meg. | Or.-Or.-Grn. " " " " |
| 123 | 22KΩ | ½ | RC22A223M | BTS-22K | Red-Red-Or. Reactance Cathode |
| 124 | 1 Meg. | ½ | RC22A105M | BTS-1 Meg. | Br.-Blk.-Grn. Reactance Plate Load |
| 125 | 470KΩ | ½ | RC22A474M | BTS-470K | Yl.-Vi.-Yl. Reactance Screen Dropping |
| 126 | 22KΩ | ½ | RC22A223M | BTS-22K | Red-Red-Or. Bleeder |
| 127 | 470KΩ | ½ | RC22A474M | BTS-470K | Yl.-Vi.-Yl. Reactance Cathode Dropping |
| 128 | 1 Meg. | ½ | RC22A105M | BTS-1 Meg. | Br.-Blk.-Grn. FM Pre-Amp. Grid |
| 129 | 100KΩ | ½ | RC22A104M | BTS-100K | Br.-Blk.-Grn. 1st AF Plate Load |
| 130 | 4700Ω | ½ | RC23A472M | BTS-4700 | Yl.-Vi.-Red 1st AF Cathode |
| 131 | 3.3 Meg. | ½ | RC22A335M | BTS-3.3 Meg. | Or.-Or.-Grn. Feedback |
| 132 | 330KΩ | ½ | RC22A334M | BTS-330K | Or.-Or.-Yl. Tone Comp. |
| 133 | 1000Ω | ½ | RC23A102M | BTS-1000 | Br.-Blk.-Red 2nd AF Cathode |
| 134 | 47K | ½ | RC22A473M | BTS-47K | Yl.-Vi.-Or. 2nd AF Plate Load |
| 135 | 100KΩ | ½ | RC22A104M | BTS-100K | Br.-Blk.-Yl. Tone Comp. |
| 136 | 15KΩ | ½ | RC23A153M | BTS-15K | Br.-Grn.-Or. Decoupling |
| 137 | 47Ω | 1 | RC24A470M | BTS-470 | Yl.-Vi.-Br. Decoupling |
| 138 | 15KΩ | 10 | RW03C | AB-15K | " |
| 139 | 330KΩ | ½ | RC22A334M | BTS-330K | Or.-Or.-Yl. Driver Grid |
| 140 | 47KΩ | ½ | RC23A473K | BTS-47K | Yl.-Vi.-Or. Driver Plate Load |
| 141 | 1000Ω | ½ | RC22A102K | BTS-1000 | Br.-Blk.-Red Driver Cathode |
| 142 | 47KΩ | ½ | RC22A473K | BTS-47K | Yl.-Vi.-Or. Phase Inverter Grid |
| 143 | 47KΩ | ½ | RC22A473K | BTS-47K | Yl.-Vi.-Or. Phase Inverter Plate |
| 144 | 1000Ω | ½ | RC22A102K | BTS-1000 | Br.-Blk.-Red Phase Inverter Cathode |
| 145 | 22K | ½ | RC22A223K | BTS-22K | Red-Red-Or. Hum Balance |
| 146 | 470KΩ | ½ | RC22A474K | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 147 | 470KΩ | ½ | RC22A474K | BTS-470K | Yl.-Vi.-Yl. " " |
| 148 | 220Ω | 2 | RC25A221K | BW-2-220 | Red-Red-Br. Output Cathode |
| 149 | 150KΩ | ½ | RC22A154M | BTS-150K | Br.-Grn.-Yl. Feedback |
| 150 | 10Ω | ½ | RC23A100M | BW-½-10 | Br.-Blk.-Blk. Series Pilot Light |
| 151 | 220KΩ | ½ | RC23A224M | BTS-220K | Red-Red-Yl. Bleeder |
| 152 | 15KΩ | ½ | RC23A153M | BTS-15K | Br.-Grn.-Or. " |

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDARSON PART No. | REPLACEMENT DATA: MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 153 | 117V AC @ 1.13A | 710V AC .14A DC | 5.2VAAC @ 3.0A | 6.3V AC @ 4.1A | TP0R00 | P-6314 Plus P-6134§ | | |
| | | | | SEC. 4 6.7V AC @ .9A | | | | |

§Mount extra filament transformer under chassis.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDAR'N PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 154 | 800Ω CT | 3.4Ω | 400Ω CT | .5Ω | TA0000 | A-3824 | T22S56 | A-2901** | **Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: JENSEN PART No. | REPLACEMENT DATA: QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 155 | FIELD RES. 650Ω | VC IMP. 3.4Ω | SE2R | | 12E60‡ | ‡Replace output transformer to match 6-8Ω voice coil. |
| 156 | CONE DIA. 11-3/4" | VC DIA. 1" | | | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA BENDIX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 62 | 10 | 500 | CM5A06 | 1468-00001 | 5W5Q1 | MO.5-41 | MS-41 | De-emphasis |
| 63 | 680 | 500 | CM4A42 | 1468-00075 | 1W5T7 | MW.5-37 | 1FM-37 | RF Bypass |
| 64 | 1000 | 500 | CM5L01 | 1468-001 | 1W5D1 | MW.5-21 | 1FM-21 | IF Coupling |
| 65 | 47 | 300 | CC8B30 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap.-Cer. |
| 66 | 1000 | 500 | CM5L01 | 1468-001 | 1W5D1 | MW.5-21 | 1FM-21 | RF Bypass Pwr. Supply |
| 67 | 15 | 300 | CC6B24 | | | | MS-415 | Osc. Coupling-Cer. |
| 68 | 5 | 300 | CC7B19 | 1469-000005 | 5R5V5 | MOS.5-55 | MS-55 | Fixed Trimmer-Cer. |
| 69 | 1.5 | 300 | CC9A12 | | | | | FM Conv. Plate Byp.-Cer. |
| 70 | 470 | 500 | CM6L33 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | FM Conv. Cathode Bypass |
| 71 | 33 | 300 | CC9B28 | 1468-00004 | 5W5Q4 | MO.5-44 | 1FM-44 | FM Osc. Grid Cap.-Cer. |
| 72 | 47 | 300 | CC8B30 | 1468-00005 | 5W5Q4 | MO.5-45 | 1FM-45 | RF Coupling-Cer. |
| 73 | 12 | 300 | CC6B23 | 1468-00001 | 5W5Q1 | MO.5-41 | MS-41 | " " " |
| 74 | 4.7 | 300 | CC9A18 | 1468-000005 | 5W5V5 | MO.5-55 | MS-55 | " " " |
| 75 | 100 | 500 | CM6L22 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | " " " |
| 76 | 150 | 500 | CM5A26 | 1469-00015 | 5R5T15 | MOS.5-315 | MS-315 | Fixed Trimmer |
| 77 | 100 | 500 | CM6L22 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | RF Coupling |
| 78 | 150 | 500 | CM5A26 | 1469-00015 | 5R5T15 | MOS.5-315 | 1FM-315 | Fixed Trimmer |
| 79 | 4700 | 500 | CM5L72 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Filament Bypass |

*Omit one section.
†Parallel sections to obtain desired capacity.
Note-If either of Items 60 or 61 need to be replaced the same value should be used. If one is replaced with another value then the other should be replaced also with the same value.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA BENDIX PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 80A | 2 Meg. | ½ | RV4C01 | D18-139X | AT-116 | Volume Control tapped @ 1 Meg. |
| B | Shaft | | Not Req. | A & C3# | FS-5 | Attach to 80A per instructions |
| 81A | 50KΩ | ½ | RV0C00 | D13-123 | M-46-Z | Treble Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 81A per instructions |
| 82A | 1 Meg. | ½ | RV4C02 | D13-137 | M-65-Z | Bass Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 82A per instructions |
| 83A | 25KΩ | ½ | | D11-120 | M-40-S | Hum Bal. Control-Later production |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 83A per instructions |
| 83 | 1000Ω | 1 | RV0C03 | W-1000 | 43-1000 | Hum Bal. Control-Early Production |

#Use C3 coupler and part of original shaft.

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA BENDIX PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 84 | 4.7 Meg. | ½ | RC22A475M | BTS-4.7 Meg. | Yl.-Vi.-Grn. RF Grid |
| 85 | 4.7 Meg. | ½ | RC22A475M | BTS-4.7 Meg. | Yl.-Vi.-Grn. " " |
| 86 | 120KΩ | ½ | RC23A124K | BTS-120K | Br.-Red-Yl. RF Screen |
| 87 | 4700Ω | ½ | RC23A472M | BTS-4700 | Yl.-Vi.-Red RF Plate Decoup. |
| 88 | 470KΩ | ½ | RC22A474M | BTS-470K | Yl.-Vi.-Yl. F. Conv. Grid |
| 89 | 2200Ω | ½ | RC22A222M | BTS-2200 | Red-Red-Red FM Conv. Cathode |
| 90 | 22KΩ | ½ | RC22A223K | BTS-22K | Red-Red-Or. FM Osc. Grid |
| 91 | 4700Ω | ½ | RC23A472M | BTS-4700 | Yl.-Vi.-Red FM Osc. Plate Load |
| 92 | 47KΩ | ½ | RC22A473M | BTS-47K | Yl.-Vi.-Or. FM Conv. Plate Decoupling |
| 93 | 100Ω | ½ | RC22A101M | | Br.-Bl.-Br. Parasitic Suppressor |
| 94 | 1.5 Meg. | ½ | RC22A155M | BTS-1.5 Meg. | Br.-Grn.-Grn. AM Conv. Grid |
| 95 | 150Ω | ½ | RC22A151K | | Br.-Grn.-Br. Parasitic Suppressor |
| 96 | 4700Ω | ½ | RC23A472M | BTS-4700 | Yl.-Vi.-Red AM Conv. Screen |
| 97 | 27KΩ | ½ | RC22A273K | BTS-27K | Red-Vi.-Or. Bleeder |
| 98 | 4.7 Meg. | ½ | RC22A475M | BTS-4.7 Meg. | Yl.-Vi.-Grn. AVC Network |
| 99 | 22KΩ | ½ | RC22A223K | BTS-22K | Red-Red-Or. AM Osc. Grid |
| 100 | 1.5 Meg. | ½ | RC22A155M | BTS-1.5 Meg. | Br.-Grn.-Grn. AVC Network |
| 101 | 47Ω | ½ | RC22A470K | | Yl.-Vi.-Blk. 1st IF Cathode |
| 102 | 10KΩ | 1 | RC24A103M | BTA-10K | Br.-Blk.-Or. 1st IF Decoupling |
| 103 | 220Ω | ½ | RC22A221M | | Red-Red-Br. 2nd IF Cathode |
| 104 | 68KΩ | ½ | RC22A473M | BTS-68K | Blue-Gray-Or. Limiter Load |
| 105 | 1000Ω | ½ | RC22A102M | BTS-1000 | Br.-Blk.-Red 2nd IF Screen Decoupling |
| 106 | 6800Ω | 1 | RC24A682K | BTA-6800 | Blue-Gray-Red 2nd IF Decoupling |
| 107 | 220KΩ | ½ | RC22A224M | BTS-220K | Red-Red-Yl. AM Diode Load |
| 108 | 1.5 Meg. | ½ | RC22A155M | BTS-1.5 Meg. | Br.-Grn.-Grn. AVC Network |
| 109 | 100KΩ | ½ | RC22A104M | BTS-100K | Br.-Blk.-Yl. De-emphasis |

DATE 10/48-#4816-5 SET #46-FOLDER #5

# PARTS LIST AND DESCRIPTIONS (Continued)

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA BENDIX PART No. | REPLACEMENT DATA MEISSNER PART No. |
|---|---|---|---|---|---|
| 157 | Loop Ant. | | .8Ω | | |
| 158 | FM Dipole | | | | |
| 159 | BC Ant.Coil | 40Ω | 1Ω | TR1H00 | 14-1056 |
| 160 | SW " " | 1.3Ω | .1Ω | TR1H00 | 14-1064 |
| 161 | FM " " | 0Ω | 0Ω | LA0F00 | |
| 162 | BC RF " | 75Ω | 4Ω | TR1L00 | 14-1057 |
| 163 | SW " " | 9.5Ω | .1Ω | TR1C00 | 14-1065 |
| 164 | FM " " | | 0Ω | L00F00 | |
| 165 | FM RF Plate Coil | | .3Ω | LF0A03 | |
| 166 | FM Conv. Plate Coil | | .6Ω | LF0A01 | |
| 167 | BC Osc. Coil | .7Ω | 7Ω | LO1B01 | 14-1060 |
| 168 | SW Osc.Coil | | .1Ω | LO1C00 | |
| 169 | FM " " | | 0Ω | LO1F00 | |
| 170 | AM 1st IF | 12Ω | 12Ω | TI0C10 | 16-6658 |
| 171 | FM " " | .7Ω | .9Ω | TI0C07 | |
| 172 | AM 2nd IF | 12Ω | | TI0D09 | 16-6670 |
| 173 | FM 2nd IF | .9Ω | .9Ω | TI0I01 | |
| 174 | FM Det.Tran. | 1.2Ω | 2.7Ω | TI0D15 | |
| 175 | Filament Choke | | .1Ω | LF0A02 | |
| 176 | " | | .1Ω | LF0A02 | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA BENDIX PART No. | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| 177-179 | Bayonet | 6-8 | 0.25 | Blue | | | Type 44 |

## PHONO CARTRIDGE

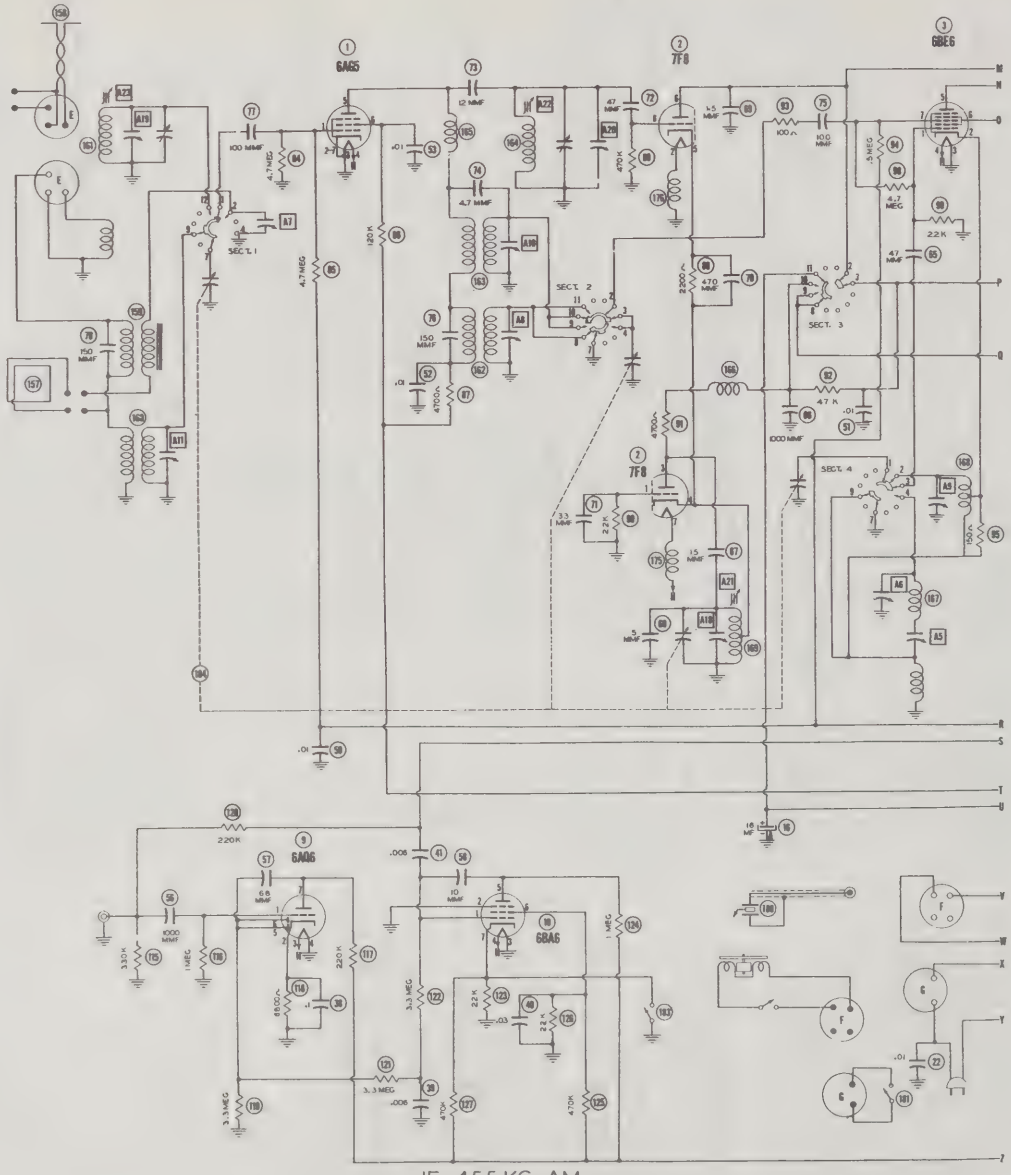
| ITEM No. | REPLACEMENT DATA BENDIX PART No. | REPLACEMENT DATA ASTATIC PART No. | REMARKS |
|---|---|---|---|
| 180 | | Nylon 1-J | Nylon 1-J Original Part |

## MISCELLANEOUS

| ITEM No. | PART NAME | BENDIX PART No. | NOTES |
|---|---|---|---|
| 181 | Switch | SR2L02 | Power |
| 182 | " | SR4G00 | Band-Phono |
| 183 | " | SR2A02 | Push-o-matic |
| 184 | Tuning Gang | CV0E00 | (15-515MMF, 15-515MMF, 15-355MMF) |
| | Dial Glass | DS0E01 | |

DISASSEMBLY INSTRUCTIONS

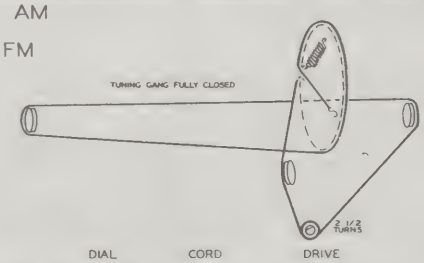
1. Remove seven push-on type control knobs.
2. Remove twenty-one wood screws holding panel on back of cabinet. Remove panel from cabinet.
3. Remove speaker plug from speaker.
4. Disconnect AC power plug.
5. Remove pilot light from lower front of cabinet.
6. Remove power supply plug from tuning chassis.
7. Remove phono-motor plug from under record changer.
8. Remove four hex head bolts holding power supply chassis in cabinet. Remove chassis.
9. Remove four hex nuts holding speaker in cabinet. Remove speaker from cabinet.
10. Remove phono-pickup plug from tuning chassis.
11. Remove FM antenna plug from chassis.
12. Remove loop antenna plugs from chassis.
13. Remove four hex head bolts holding tuning chassis in cabinet. Remove chassis from cabinet.




IF=455 KC AM

IF=10.7 MC FM

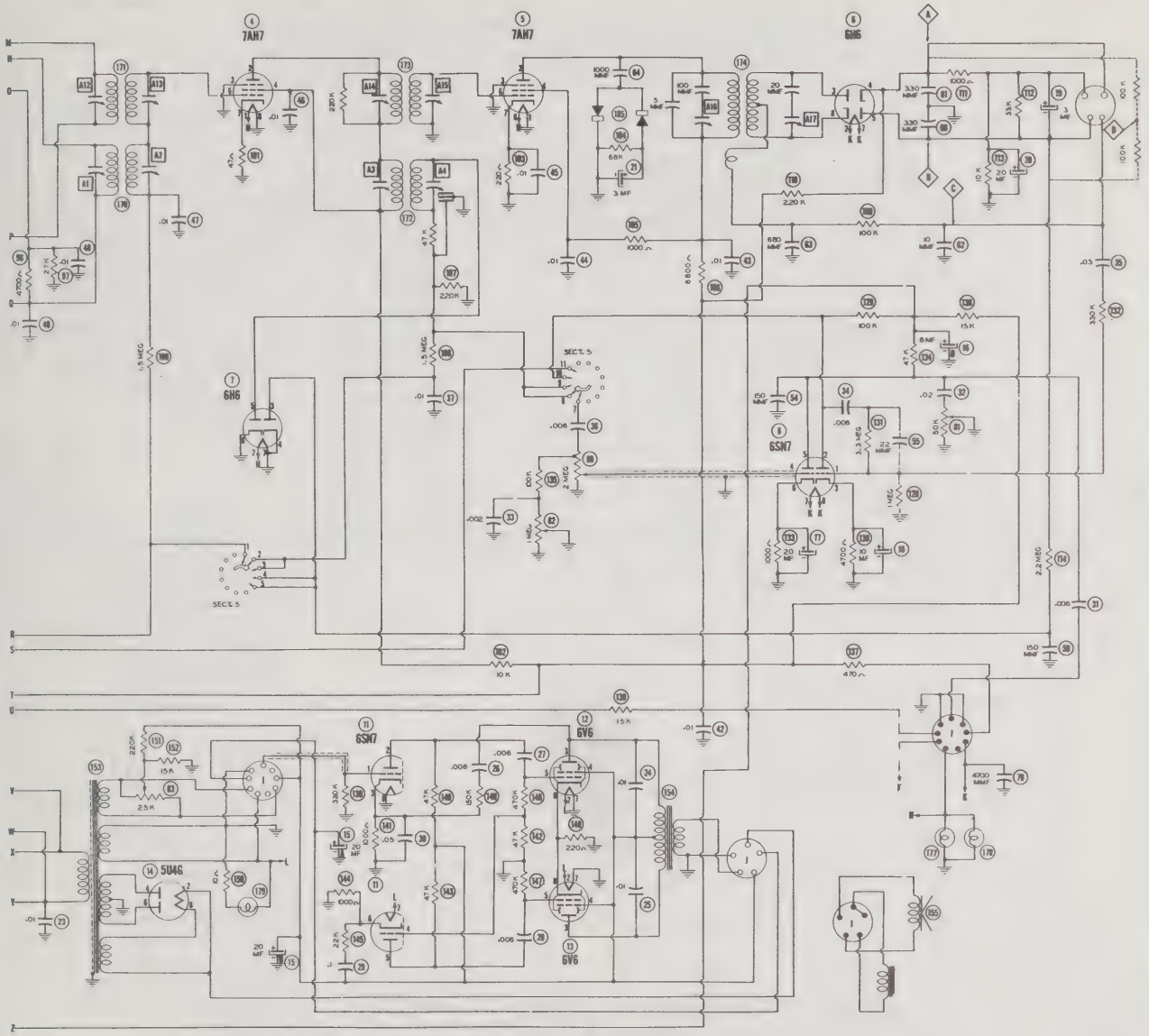
| STAGE GAIN MEASUREMENTS | | | |
|---|---|---|---|
| RF GRID TO CONVERTER GRID | .9X | | 600KC |
| CONVERSION GAIN | 45X | IN<br>OUT | 600KC<br>455KC |
| INPUT IF TRANSFORMER | .7X | | 455KC |
| IF TUBE | 140X | | 455KC |
| OUTPUT IF TRANSFORMER | .6X | | 455KC |
| 1ST AUDIO | 13X | | 400 ~ |
| 2ND AUDIO | 4X | | 400 ~ |
| OUTPUT | 16X | | 400 ~ |
| INPUT TO AMP. | 55X | | 400 ~ |
| [illegible] INPUT | 16X | | 400 ~ |




THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

**The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1948




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6AU6 | -.1VDC | 0V. | 0V. | 6.3VAC | 280VDC | 115VDC | 0V. | - |
| 2 | 7F8 | -2.2VDC‡ | 0V. | 155VDC | 0V. | 2.8VDC | 155VDC | 6.3VAC | 0V. |
| 3 | 6BA6 | -7.1VDC‡ | 0V | 0V. | 6.3VAC | 175VDC | 110VDC | .4VDC | |
| 4 | 7AH7 | 6.3VAC | 255VDC | 255VDC | 0V. | 0V. | -.1VDC | .4VDC | 0V. |
| 5 | 7AH7 | 0V. | 255VDC | 255VDC | 0V. | 0V | 0V. | 2.2VDC | 6.3VAC |
| 6 | 6H6 | 0V. | 6.3VAC | - .4VDC | 0V. | -.4VDC | 0V. | 0V. | 0V. |
| 7 | 6H6 | 0V. | 19VDC | 14VDC | 19VDC | 15VDC | 14VDC | 14VDC | 14VDC |
| 8 | 6SN7GT | 0V. | 105VDC | 4.4VDC | 0V. | 100VDC | 5.1VDC | 19VDC | 19VDC |
| 9 | 6AQ5 | 0V. | -.2VDC | 6.3VAC | 0V. | 0V. | 0V | 140VDC | - |
| 10 | 6BA6 | 0V. | 0V. | 6.3VAC | 0V. | 195VDC | 0VDC | 2.2VDC | - |
| 11 | 6SN7GT | 0V. | 145VDC | 4.4VDC | 0V. | 140VDC | 4.5VDC | 6.3VAC | 0V. |
| 12 | 6V6GT | 0V. | 6.3VAC | 310VDC | 320VDC | 0V. | 0V. | 0V. | 16VDC |
| 13 | 6V6GT | 0V. | 6.3VAC | 310VDC | 320VDC | 0V. | -.3VAC | 0V. | 16VDC |
| 14 | 5U4G | 0V. | 350VDC | 0V. | 356VAC | 0V. | 356VAC | 0V. | 390VDC |

‡TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6AU6 | 3 Meg. | 0Ω | 0Ω | .1M | 550Ω | 150KΩ | 0Ω | - |
| 2 | 7F8 | 220Ω | .1Ω | 650Ω | 0Ω | 2.2KΩ | 110K | .2M | 470K |
| 3 | 6BA6 | 220K | .7Ω | 3Ω | .1M | 270KΩ | 2.5K | 1 Meg. | - |
| 4 | 7AH7 | .1Ω | 410K | 410K | 0Ω | 0Ω | 3 Meg. | 47Ω | 1Ω |
| 5 | 7AH7 | 0Ω | 520Ω | 520Ω | 0Ω | 0Ω | .9Ω | 250Ω | .1Ω |
| 6 | 6H6 | 0Ω | .1Ω | 2 Meg. | 0Ω | 270KΩ | 0Ω | 0Ω | 1Ω |
| 7 | 6H6 | 0Ω | 1KΩ | INF. | 11KΩ | 40KΩ | 10KΩ | 11KΩ | 1KΩ |
| 8 | 6SN7GT | 1.1Meg. | 140KΩ | 4.7KΩ | 1.5 Meg. | 50KΩ | 1KΩ | 1KΩ | .7KΩ |
| 9 | 6AQ5 | 1 Meg. | 6.8KΩ | .1Ω | 0Ω | 3.3 Meg. | 3.3 Meg. | 240KΩ | |
| 10 | 6BA6 | 10 Meg. | 0Ω | .1Ω | 0Ω | 1 Meg. | 220KΩ | 250KΩ | - |
| 11 | 6SN7GT | 330KΩ | 80KΩ | 1KΩ | 47KΩ | 90KΩ | 1KΩ | 1Ω | 0Ω |
| 12 | 6V6GT | 0Ω | .1Ω | 360Ω | 360Ω | 120KΩ | 47KΩ | 0Ω | 250Ω |
| 13 | 6V6GT | 0Ω | 1Ω | 360Ω | 360Ω | 47KΩ | 2.5K | 0Ω | 250Ω |
| 14 | 5U4G | 0Ω | 30KΩ | 1MF. | .6K | 1MF. | 7KΩ | 1MF. | 30KΩ |

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1948

## FM ALIGNMENT

FM Dummy antenna consists of 300Ω resistor in series with 30Ω resistor with a .01 MFD. capacitor connected to junction of the 300Ω and 30Ω resistors. The 300Ω resistor is connected to the ungrounded side of the 300Ω coaxial lead at the FM Ant. socket. The 30Ω resistor is connected to chassis. The 30Ω resistor may be varied to match the output impedance of the signal generator.

### FM ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Frequency modulate the signal with 60~, 450KC sweep. Connect the synchronized sweep voltage from the signal generator to the horizontal amplifier. The horizontal sweep voltage may be taken from power line if signal generator does not have a sync. voltage output. There may be some phase shift encountered between signal generator and scope horizontal sweep resulting in a double trace pattern per Fig. 2. IF provision is made for this in the scope rotate phase control until the two curves coincide as in Fig. 1. If no provision is made for this the same thing may be accomplished by inserting a capacitor of suitable value (.01to .1 MFD) in series with the horizontal sweep input.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7 | .05 MFD. | High side to center "FM" stator of tuning cap. Low side to chassis. | 10.7MC (unmodulated) | FM (1st position clockwise) | Tuning cap. fully open. | DC probe of VTVM connected to Point (A). Common lead to Point (B). | A12,A13 A14,A15, A16 | Connect a short from extreme left "FM" stator of tuning cap. to chassis. Adjust for maximum deflection in order given and repeat. |
| | | | | | | CONNECT SCOPE | | |
| 8 | .05 MFD | High side to center "FM" stator of tuning cap. Low side to chassis. | Approx. 10.7MC (freq. modulated. Adjust signal gen. until curve of Figure 1 is centered on horizontal scope sweep line. | FM (1st position clockwise) | Tuning cap. fully open. | Vertical amplifier to Point (A). Ground to chassis | A17 | Adjust for maximum symmetry per curve of Fig. 1. It may be necessary to adjust alternately A16 and A17 to obtain best possible curve. |
| 9 | FM Dummy Ant. (See prealignment notes.) | High side to .01 MFD. cap. of dummy. Low side to chassis. | 106MC (freq. modulated) | " | 106MC | " | A18 | Remove short from "FM" stator from Step 7 and adjust until "S" curve is centered on horizontal sweep scope line. Check for image by tuning sig. gen. to 84.6MC. If signal is not heard then A18 is adjusted correctly. If signal is heard retune sig. gen. to 106MC and loosen trimmer until next peak is obtained. Then adjust until "S" curve is centered on horizontal sweep scope line and recheck for image. |
| 10 | " | " | " | " | " | " | A19, A20 | Rock tuning cap. to keep "S" curve centered on horizontal sweep scope line while adjusting A19 and A20 for maximum height of curve. |
| 11 | " | " | 90MC | " | 90MC | " | A21 | Adjust until "S" curve is centered on horizontal scope sweep line. |
| 12 | " | " | " | " | " | " | A22, A23 | Adjust A22, A23 for maximum height of curve. Repeat Steps 9, 10, 11 & 12 until no further improvement can be made. |

### FM ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

The VTVM must not be AC-DC or with ground connected to AC line or through resistor. The values of the two 100KΩ resistors in Step 8 should be within 1% of each other.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7 | .01 MFD. | High side to center "FM" stator of tuning cap. Low side to chassis. | 10.7MC (unmodulated) | FM | Tuning cap. fully open. | DC probe of VTVM connected to Point (A). Common lead to Point (B). | A12,A13 A14,A15 A16 | Connect a short from extreme left "FM" stator of tuning cap. to chassis. Adjust for maximum deflection in order given and repeat. |
| 8 | .01 MFD | " | " | " | " | Connect two 100KΩ resistors as shown on schematic. DC probe to point (A). Common lead to Point (B). | A17 | If available use zero center scale VTVM. Adjust for zero deflection. Repeat Step 7, adjusting A16 only, for maximum deflection and Step 8 adjusting A7 for zero deflection several times to assure correct alignment. |
| 9 | FM Dummy (See prealignment notes) | High side to .01 MFD cap. of dummy. Low side to chassis. | 106MC (amplitude modulated) | " | 106MC | DC probe of VTVM connected to Point (A). Common lead to Point (B). | A18 | Remove short from FM stator of Step 13. Adjust for maximum deflection. Check for image as described in Step 9 under visual alignment. |
| 10 | " | " | " | " | Tune for maximum deflection. | " | A19, A20 | Rock tuning cap. and adjust for maximum deflection. |
| 11 | " | " | 90MC | " | 90MC | " | A21, A22, A23. | Adjust for maximum deflection. Repeat Steps 9, 10 and 11 until no further increase in deflection can be obtained. |

FIG. 1

FIG. 2

PUSHBUTTON ADJUSTMENTS

1. Turn receiver on and allow it to warm up for about 15 minutes.
2. Remove pushbuttons by pulling out, and loosen set screws behind buttons.
3. Manually tune in desired station and push any button shaft in completely.
4. Holding shaft in tighten set screw firmly.
5. Check accuracy of setting by detuning with manual control and retuning with button shaft. If setting is off repeat Steps 2, 3, 4 and 5.
6. To set up the remaining buttons follow the same procedure as outlined above.
7. Replace pushbuttons.

FOR AM ALIGNMENT SEE FRONT PAGE

| | |
|---|---|
| **TRADE NAME** | Browning, Model RV-10, RV-11 |
| **MANUFACTURER** | Browning Laboratories, Inc., Winchester, Mass. |
| **TYPE SET** | AC Operated FM Tuner with Self-Contained Power Supply |
| **TUBES** (NINE) | Types, 6AU6 RF Amp., 7F8 Converter, 6AU6 1st IF Amp., 6AU6 2nd IF Amp., 6SJ7 1st Limiter, 6SJ7 2nd Limiter, 6H6 Discriminator, 6U5/6G5 Tuning Eye, 80 Rectifier |
| **POWER SUPPLY** | 110-120 Volts AC |
| **TUNING RANGE**—FREQ. MOD. | 88-108MC RATING .56 Amp. @ 117 Volts AC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

Use an insulated alignment screwdriver for all adjustments.

**IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE**

Use a freq. modulated signal with 60 ∿ modulation. Use 450KC sweep in all Steps with exception of Step 3 where 300KC sweep is used. Connect the synchronized sweep voltage from the sig. gen. to the horizontal input amplifier of scope. The horizontal sweep voltage may be taken from the power line if the sig. generator does not have a sync. voltage output. There may be some phase shift encountered between sig. gen. and scope horizontal sweep. If provision is made for this in the scope rotate phase control until the two curves coincide. If no provision is made for this or sync. voltage is taken from power line, the same thing may be accomplished by inserting a cap. of suitable value (.01 to .1 MFD) in series with the horizontal sync. input.

To provide marker pip for correct alignment use an accurately calibrated AM sig. gen. set to 8.25MC. Use a small mica condenser in series with AM sig. gen. output and connect in parallel with the FM sig. gen. In all cases adjust FM sig. gen. so that marker pip is in center of horizontal scope sweep line. Attenuate output of AM sig. gen. so that marker pip is just visible.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .01 MFD | High side to Pin 1 (grid) of 6AU6 1st IF Tube (3). Low side to chassis. | 8.25MC (Freq. Mod.) | Tuning cap. fully open. | Vertical input to Point Ⓐ. Ground to chassis. | A1,A2, A3,A4. | Adjust for maximum amplitude, and symmetry of pattern on either side of marker pip per Fig. 1. |
| 2 | .01 MFD | High side to Pin 8 (grid) of 7F8. Low side to chassis. | " | " | " | A5,A6 | " |
| 3 | .01 MFD | High side to Pin 1 (grid) of 6AU6 2nd IF Tube/(4). Low side to chassis. | 8.25MC (Freq. Modulated 300KC sweep) | " | Vertical input to Point Ⓑ. Ground to chassis. | A7,A8 | Alternately adjust A7 for maximum amplitude and A8 for symmetry and linearity on either side of marker pip of pattern per Fig. 2. Continue with RF Alignment in Step 6. |

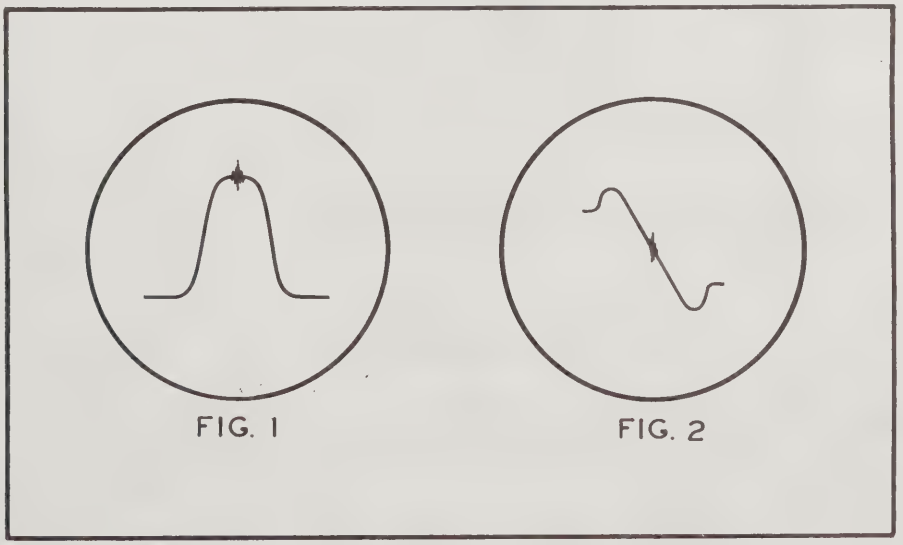


FIG. 1



FIG. 2

FOR ALTERNATE IF ALIGNMENT AND RF ALIGNMENT SEE PAGE 4 OF THIS FOLDER

BROWNING MODELS
RV-10, RV-11

BROWNING MODELS
RV-10, RV-11

**HOWARD W. SAMS & CO., INC.** **Indianapolis Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-6 SET #46-FOLDER #6

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: BROWNING PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6AU6 | 6AU6 | 7BK | |
| 2 | Converter | 7F8 | 7F8 | 8BW | |
| 3 | 1st IF Amp. | 6AU6 | 6AU6 | 7BK | |
| 4 | 2nd IF Amp. | 6AU6 | 6AU6 | 7BK | |
| 5 | 1st Limiter | 6SJ7 | 6SJ7 | 8N | |
| 6 | 2nd Limiter | 6SJ7 | 6SJ7 | 8N | |
| 7 | Discriminator | 6H6 | 6H6 | 7Q | |
| 8 | Tuning Eye | 6U5/6G5 | 6U5/6G5 | 6R | |
| 9 | Rectifier | 80 | 80 | 4C | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: BROWNING PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 10A | 40 | 450 | | AF88FJ | UP4445 | DY-2x40-450 | EL-240 | ■ Filter |
| B | 40 | 450 | | | | | | " " |
| 11 | .05 | 600 | | 684-05 | DT6S5 | ST-6-05 | TC-15 | Tuning Eye Grid Bypass |
| 12 | .05 | 600 | | 684-05 | DT6S5 | ST-6-05 | TC-15 | Audio Coupling |
| 13 | 1000 | 300 | | 1468-001 | 1W5D1 | MO.3-21 | 1FM-21 | De-emphasis |
| 14 | 50 | 500 | | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Bypass |
| 15 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd Lim. Plate Decoup.-Cer. |
| 16 | 50 | 500 | | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | 2nd Lim. Screen Bypass |
| 17 | 25 | 500 | | 1468-000025 | 5W5Q25 | MO.5-425 | MS-425 | IF Coupling |
| 18 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st Lim. Screen Byp.-Cer. |
| 19 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | RF Bypass Pwr. Supply-Cer. |
| 20 | 50 | 500 | | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | 1st Lim. Grid Filter |
| 21 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd IF Decoupling-Cer. |
| 22 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd IF Screen Bypass-Cer. |
| 23 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd IF Cathode Byp.-Cer. |
| 24 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st IF Decoupling-Cer. |
| 25 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st IF Screen Byp.-Cer. |
| 26 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st IF Cathode Byp.-Cer. |
| 27 | 4700 | 300 | | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Conv. Plate Decoup.-Cer. |
| 28 | 1000 | 300 | | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | Conv. Cathode Bypass |
| 29 | 5 | 300 | | 1468-000005 | 5W5V5 | MO.5-55 | MS-55 | Osc. Coupling-Cer. |
| 30 | 1000 | 300 | | 1468-001 | 1W5D1 | MO.3-21 | 1FM-21 | Osc. Feedback |
| 31 | 470 | 500 | | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Filament Bypass |
| 32 | 22 | 500 | | 1468-000025 | 5W5Q25 | MO.5-425 | MS-425 | Osc. Grid Cap. |
| 33 | 20 | 500 | | | 5R5Q2 | MOS.5-42 | MS-42 | Fixed Padder |
| 34 | 100 | 500 | | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | RF Coupling |
| 35 | 1000 | 500 | | 1468-001 | 1W5D1 | MO.3-21 | 1FM-21 | RF Decoupling |
| 36 | 470 | 500 | | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | RF Screen Bypass |
| 37 | 50 | 500 | | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Coupling |

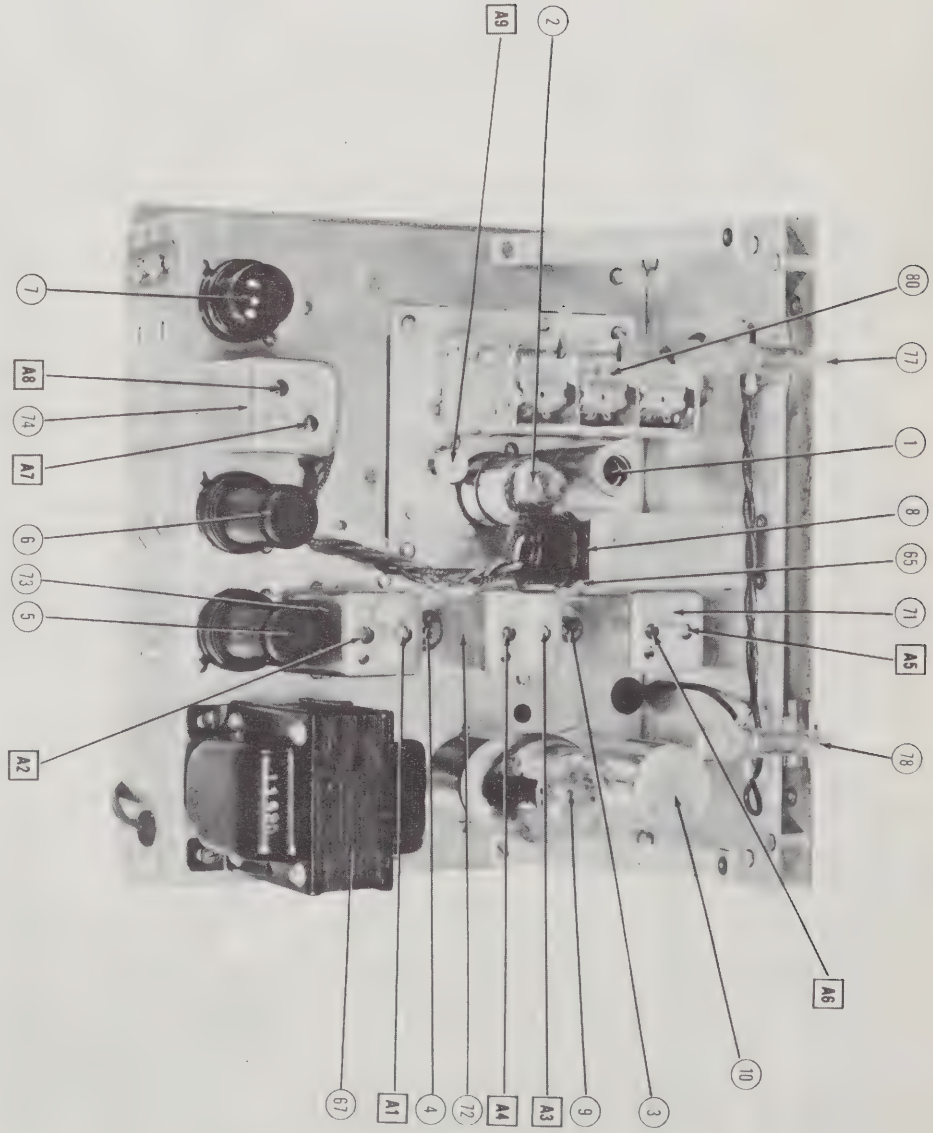
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: BROWNING PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 38A | 250KΩ | ½ | | D13-133 | M-64-Z | Volume Control |
| B | Shaft | | | A | Not Req. | Attach to 38A per instructions |
| C | Switch | | | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: BROWNING PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 39 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. Ant. Loading |
| 40 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. RF Grid |
| 41 | 22KΩ | 1 | | BTA-22K | Red-Red-Or. RF Screen |
| 42 | 1500Ω | ½ | | BTS-1500 | Br.-Grn.-Red RF Decoupling |
| 43 | 10KΩ | 1 | | BTA-10K | Br.-Blk.-Or. Osc. Plate Load |
| 44 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. Osc. Grid |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | BROWNING PART No. | IRC PART No. | |
| 45 | 1MΩ | ½ | | BTS-1M | Br.-Blk.-Grn. Conv. Cathode |
| 46 | 2.2MΩ | ½ | | BTS-2.2M | Red-Red-Grn. Conv. Plate Decoup. |
| 47 | 68K | ½ | | | Blue-Gray-Or. 1st IF Cathode |
| 48 | 10KΩ | ½ | | BTA-10K | Br.-Blk.-Or. 1st IF Screen |
| 49 | 22.00Ω | ½ | | BTS-22.00 | Br.-Red-Red 1st IF Decoup. |
| 50 | 68Ω | ½ | | | Blue-Gray-Blk. 2nd IF Cathode |
| 51 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. 2nd IF Screen |
| 52 | 22.00Ω | ½ | | BTS-22.00 | Red-Red-Red 2nd IF Decoup. |
| 53 | 68KΩ | ½ | | BTS-68K | Blue-Red-Or. 1st Limiter Grid |
| 54 | 100KΩ | ½ | | BTA-100K | Br.-Blk.-Yl. 1st Limiter Screen |
| 55 | 1KΩ | ½ | | BTS-1K | Br.-Blk.-Or. 1st Limiter Plate Load |
| 56 | 47KΩ | ½ | | BTA-47K | Red-Yl.-Or. Bleeder |
| 57 | 47KΩ | ½ | | BTS-47K | Red-Yl.-Or. 2nd Limiter Grid |
| 58 | 100KΩ | ½ | | BTA-100K | Br.-Blk.-Yl. 2nd Limiter Screen |
| 59 | 47KΩ | ½ | | BTS-47K | Red-Yl.-Or. Bleeder |
| 60 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. 2nd Limiter Plate Decoup. |
| 61 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. Disc. Diode Load |
| 62 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. " " " |
| 63 | 68KΩ | ½ | | BTS-68K | Yl.-Grn.-Or. De-emphasis |
| 64 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. Tuning Eye Grid |
| 65 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. Tuning Eye Plate Load |
| 66 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red Filter |
| 81 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red Ant. Coil Sec. Shunt |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | BROWNING PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 67 | 117V AC | 630V CT | 4.5V AC | 6.1V AC | 11695 | P-4078* | T22R31* | P-3151* |
| | @ .56A | .065A DC | @ 2.0A | @ 2.85A | | | | |

*Drill new mounting holes and add series resistor to reduce plate voltage.

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | BROWNING PART No. | MEISSNER PART No. |
| 68 | Ant. Coil | 0Ω | 0Ω | | |
| 69 | RF Coil | | 0Ω | | |
| 70 | Osc. Coil | | 0Ω | | |
| 71 | 1st IF | .2Ω | .2Ω | | |
| 72 | 2nd IF | .2Ω | .2Ω | | |
| 73 | 3rd IF | .2Ω | .2Ω | | |
| 74 | Disc. Trans. | 1.1Ω | 1.7Ω | | |
| 75 | RF Plate Choke | | .4Ω | | |
| 76 | Filament Choke | | .4Ω | | |

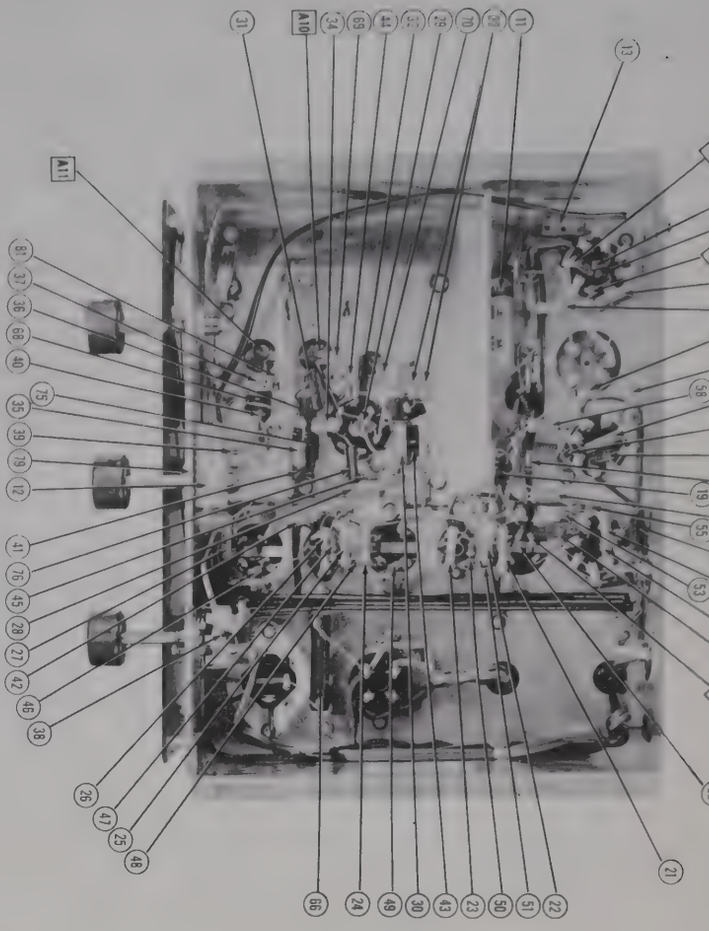
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | BROWNING PART No. | | |
| 77 | Bayonet | 6-8 | 0.15 | Brown | | | Type 47 |
| 78 | " | 6-8 | 0.15 | " | | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | BROWNING PART No. | NOTES |
|---|---|---|---|
| 79 | Switch | | FM-Phono |
| 80 | 3 Gang Var. Cap. | | |

# CHASSIS—BOTTOM VIEW



# IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

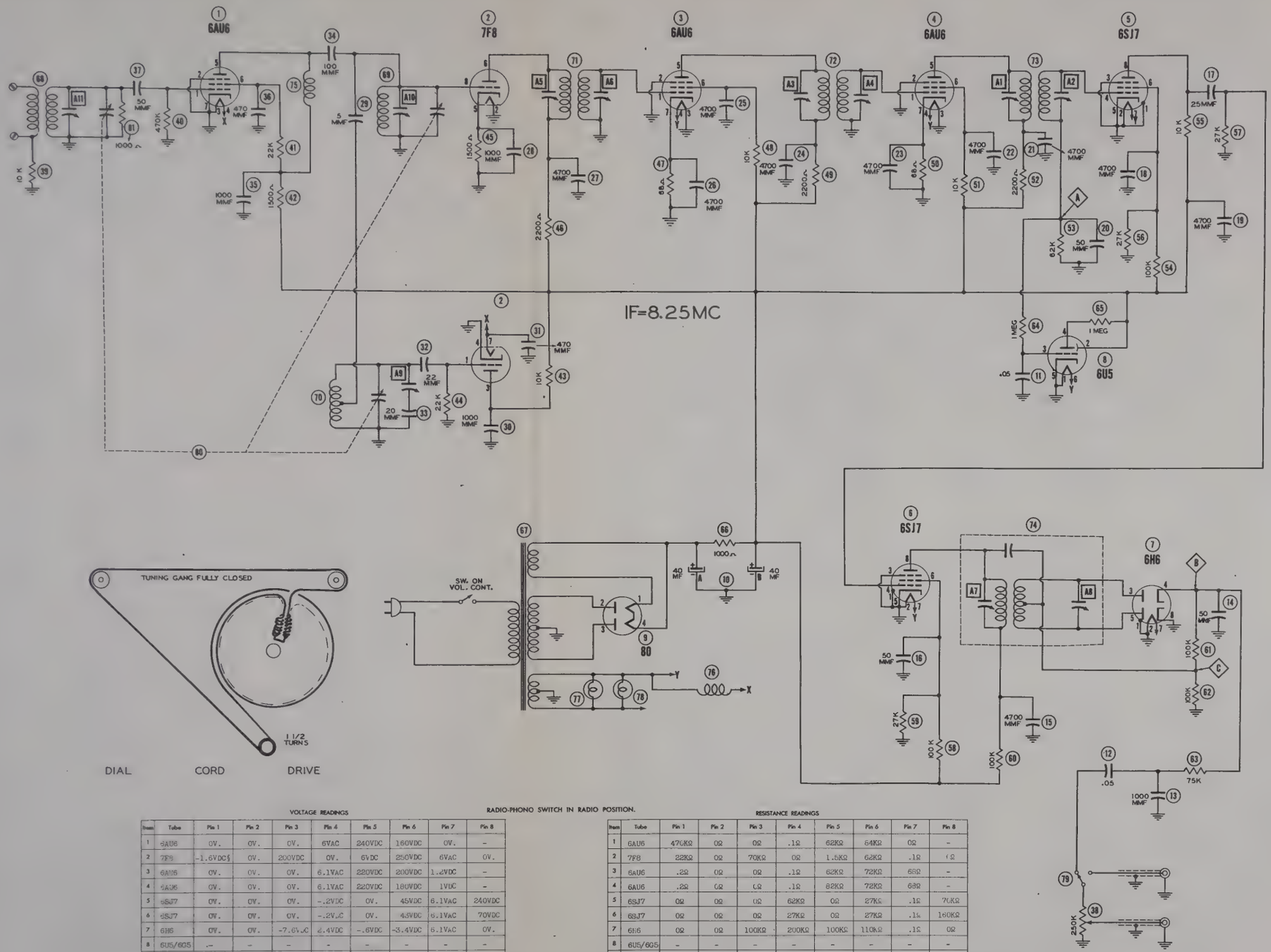
For plotting IF curve, vary sig. gen. 100KC above and below 8.25MC in Steps of 20KC. Record readings of VTVM at each setting of sig. gen. and plot curve. If curve is not similar to Fig. 1. repeat last two adjustments and replot curve.

For plotting discriminator curve, vary sig. gen. 150KC above and below 8.25MC in Steps of 20KC. Record VTVM reading at each setting of sig. gen. and plot curve. If curve is not similar to Fig. 2. repeat adjustment of A7 & A8 and recheck for curve.

## RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .01 MFD | High side to Pin 1 (grid) of 6AU6 2nd IF Tube (4). Low side to chassis. | 8.25MC (Unmodulated) | Tuning cap. fully open. | DC probe to Point ◇. Common to chassis. | A1,A2 | Solder a shunt cap. of 10 MMFD across secondary of 3rd IF transformer (73) and adjust A1 for maximum deflection. Transfer shunting cap. to primary of same transformer and adjust A2 for maximum deflection. Plot IF curve per preailignment instructions. Once curve is satisfactory do not disturb the adjustments of A1 & A2. Remove shunt cap. |
| 2 | .01 MFD | High side to Pin 1 (grid) of 6AU6 1st IF Tube (3). Low side to chassis. | " | " | " | A3,A4 | Solder a shunt cap. of 10 MMFD. across secondary of 2nd IF Transformer (72) and adjust A3 for maximum deflection. Transfer shunting cap. to primary of same transformer and adjust A4 for maximum deflection. Plot IF curve per preailignment instructions. Once curve is satisfactory do not disturb settings of A3 & A4. Remove shunt cap. |
| 3 | .01 MFD | High side to Pin 5 (grid) of 7F8. Low side to chassis. | " | " | " | A5,A6 | Solder a shunt cap. of 10 MMFD across secondary of 1st IF Transformer (71) and adjust A5 for maximum deflection. Transfer shunting cap. to primary of same transformer and adjust A6 for maximum deflection. Plot IF curve per preailignment instructions. Once curve is satisfactory do not disturb settings of A5 & A6. Remove shunt cap. |
| 4 | .01 MFD | High side to Pin 4 (grid) of 6SJ7 1st Limiter Tube (5). Low side to chassis. | " | " | DC probe to Point ◇. Common to chassis | A7 | Solder a shunt cap. of 10 MMFD across secondary of 1st IF Transformer (72) and adjust A5 for maximum deflection. Transfer shunting cap. to primary of same transformer and adjust A6 for maximum deflection. Plot IF curve per preailignment instructions. Once curve is satisfactory do not disturb settings of A5 & A6. Remove shunt cap. |
| 5 | .01 MFD | " | " | " | DC probe to Point ◇. Common to chassis | A8 | Adjust for zero deflection. Plot discriminator curve per preailignment instructions. Continue with RF alignment in Step 6. |
| 6 | 300Ω carbon res. | Across antenna terminals. | 108MC (unmodulated) | 108MC | DC probe to Point ◇. Common to chassis. | A9 | Adjust for maximum deflection. |
| 7 | " | " | 90MC | 90MC | " | Osc. Coil (70) | With a nonconducting rod compress or expand osc. coil slightly for maximum deflection. Repeat Steps 8 & 9 until no further improvement can be made. |
| 8 | " | " | 108MC | Tune for maximum deflection | " | A10 | Rock tuning cap. and adjust for maximum deflection. |
| 9 | " | " | 90MC | " | " | RF Coil (69) | With a nonconducting rod compress or expand RF coil slightly for maximum deflection. Repeat Steps 8 & 9 until no further improvement can be made. |
| 10 | .8 | " | " | " | " | All | Rock tuning cap. and adjust for maximum deflection. |

FOR ALTERNATE IF ALIGNMENT SEE FRONT PAGE OF THIS FOLDER.




VOLTAGE READINGS

RADIO-PHONO SWITCH IN RADIO POSITION.

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6AU6 | 0V. | 0V. | 0V. | 6VAC | 240VDC | 160VDC | 0V. | - |
| 2 | 7F8 | -1.6VDC§ | 0V. | 200VDC | 0V. | 6VDC | 250VDC | 6VAC | 0V. |
| 3 | 6AU6 | 0V. | 0V. | 0V. | 6.1VAC | 220VDC | 200VDC | 1.4VDC | - |
| 4 | 6AU6 | 0V. | 0V. | 0V. | 6.1VAC | 220VDC | 180VDC | 1VDC | - |
| 5 | 6SJ7 | 0V. | 0V. | 0V. | -.2VDC | 0V. | 45VDC | 6.1VAC | 240VDC |
| 6 | 6SJ7 | 0V. | 0V. | 0V. | -.2V.C | 0V. | 45VDC | 6.1VAC | 70VDC |
| 7 | 6H6 | 0V. | 0V. | -7.6V.C | -.4VDC | -.6VDC | -3.4VDC | 6.1VAC | 0V. |
| 8 | 6U5/6G5 | - | - | - | - | - | - | - | - |
| 9 | 80 | 320VDC | 315VAC | 315VAC | 320VDC | - | - | - | - |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6AU6 | 470KΩ | 0Ω | 0Ω | .1Ω | 62KΩ | 64KΩ | 0Ω | - |
| 2 | 7F8 | 22KΩ | 0Ω | 70KΩ | 0Ω | 1.5KΩ | 62KΩ | .1Ω | 0Ω |
| 3 | 6AU6 | .2Ω | 0Ω | 0Ω | .1Ω | 62KΩ | 72KΩ | 66Ω | - |
| 4 | 6AU6 | .2Ω | 0Ω | 0Ω | .1Ω | 82KΩ | 72KΩ | 66Ω | - |
| 5 | 6SJ7 | 0Ω | 0Ω | 0Ω | 62KΩ | 0Ω | 27KΩ | .1Ω | 70KΩ |
| 6 | 6SJ7 | 0Ω | 0Ω | 0Ω | 27KΩ | 0Ω | 27KΩ | .1Ω | 160KΩ |
| 7 | 6H6 | 0Ω | 0Ω | 100KΩ | 200KΩ | 100KΩ | 110KΩ | .1Ω | 0Ω |
| 8 | 6U5/6G5 | - | - | - | - | - | - | - | - |
| 9 | 80 | 60KΩ | 325Ω | 350Ω | 60KΩ | - | - | - | - |

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

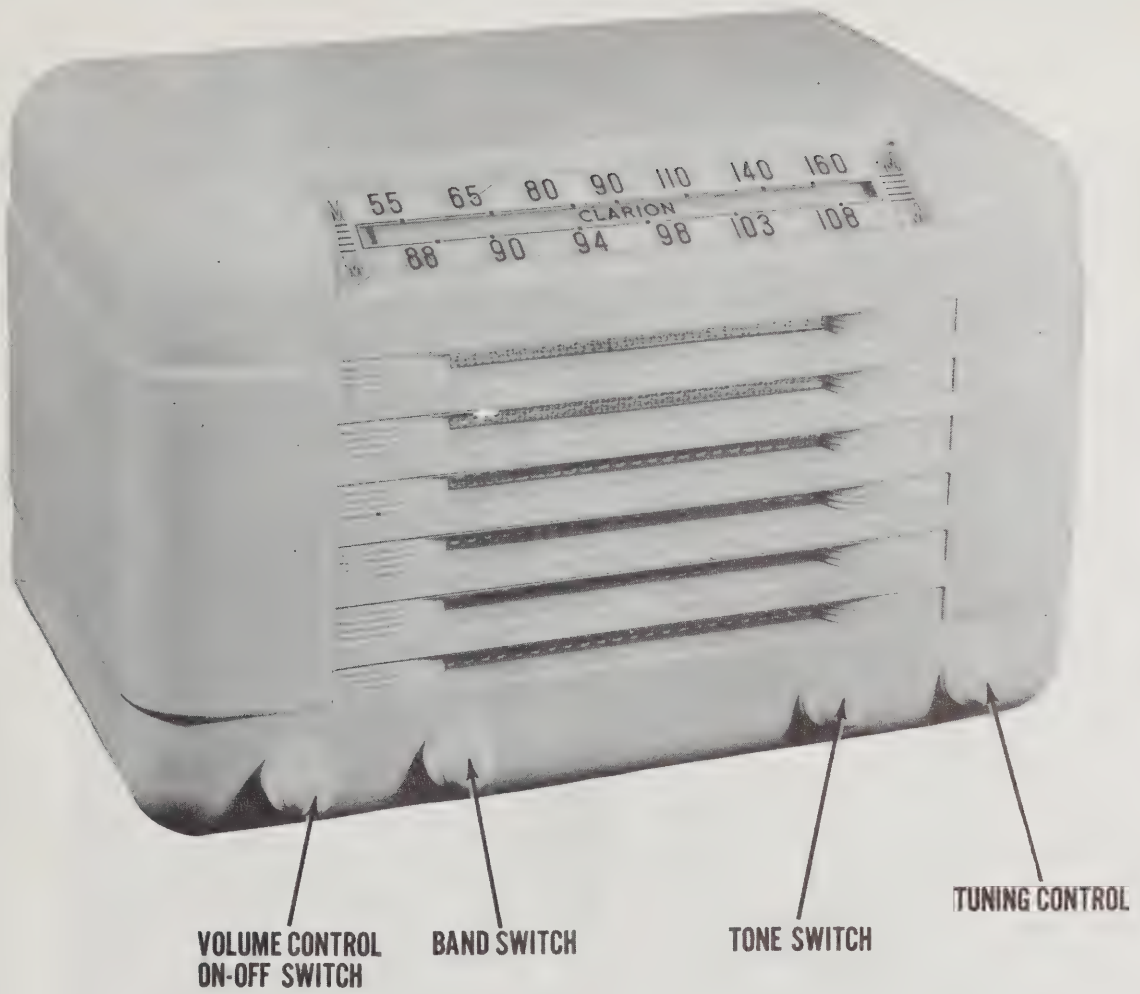
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

CLARION MODEL
13101



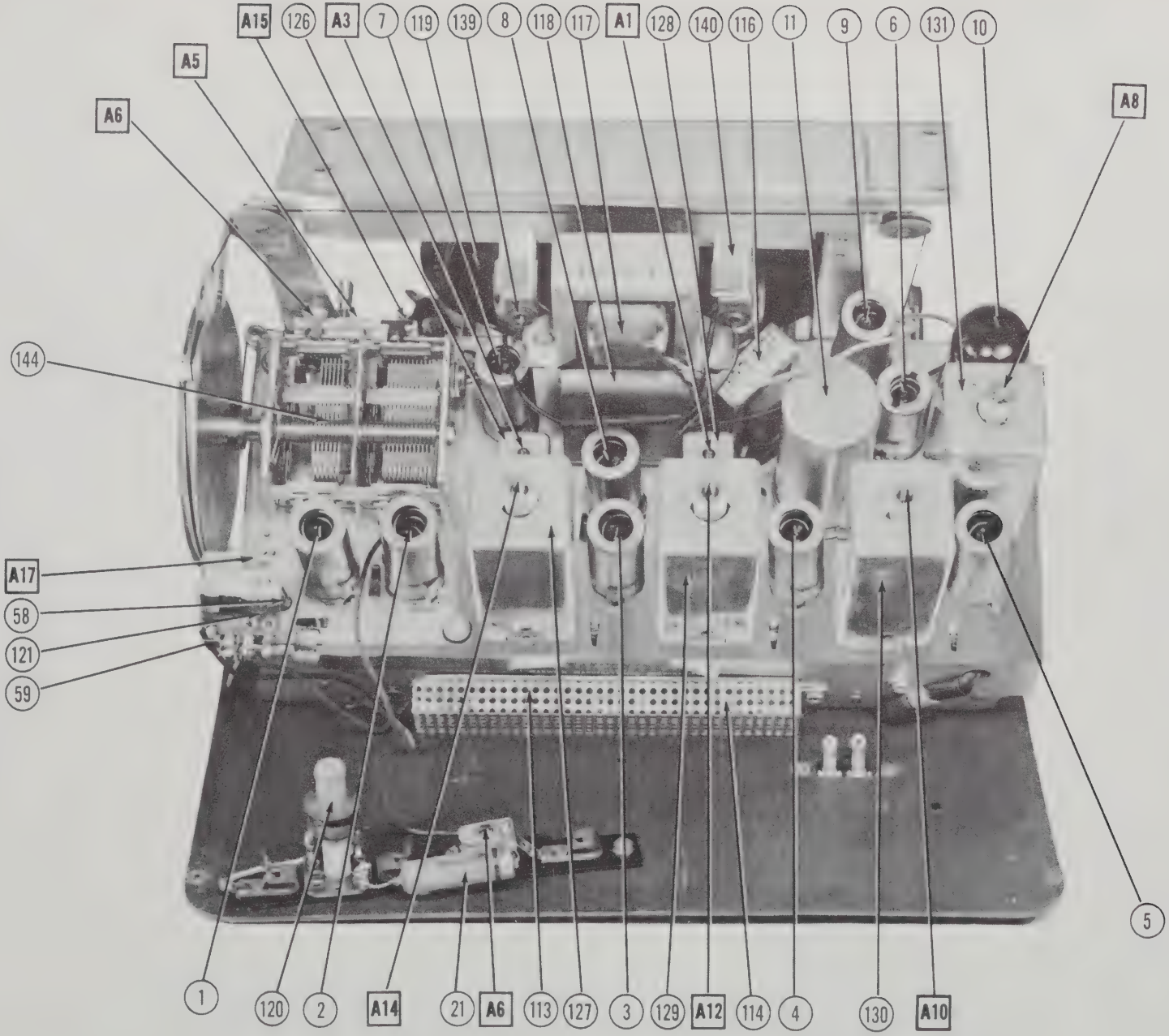

CLARION MODEL
13101

CLARION MODEL 13101

| | |
|---|---|
| TRADE NAME | Clarion, Model 13101 |
| MANUFACTUER | Warwick Mfg. Corp., 4640 W. Harrison St., Chicago 44, Ill. |
| TYPE SET | AC-DC Operated AM-FM Superheterodyne Receiver |
| TUBES (TEN) | Types, 12BA6 FM RF Amp., 12BE6 FM Converter, 12BA6 FM 1st IF Amp., 12BA6 FM 2nd IF Amp., 12BA6 FM 3rd IF Amp., 6AL5 FM Ratio Det., 12BE6 AM Converter, 12BA6 AM IF Amp., 12AT6 AM Det.-AVC-AF, 50L6GT Power Output. |
| POWER SUPPLY | 110-120 Volts AC-DC |
| RATING | .453 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1600KC FREQ. MOD. 88-108MC |

HOWARD W. SAMS & CO., INC. • • Indianapolis , Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


A15
126
A3
7
119
139
8
118
117
A1
128
140
116
11
9
6
131
10
A5
A6
A8
144
A17
58
121
59
1
120
2
A14
21
A6
113
127
3
129
A12
114
4
130
A10
5

**CLARION MODEL**
**13101**
**PAGE 3**

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| | | CLARION PART No. | STANDARD REPLACEMENT | | |
| 1 | FM RF Amp. | 12BA6 | 12BA6 | 7BK | |
| 2 | FM Converter | 12BE6 | 12BE6 | 7CH | |
| 3 | FM 1st IF Amp. | 12BA6 | 12BA6 | 7BK | |
| 4 | FM 2nd IF Amp. | 12BA6 | 12BA6 | 7BK | |
| 5 | FM 3rd IF Amp. | 12BA6 | 12BA6 | 7BK | |
| 6 | FM Ratio Det. | 6AL5 | 6AL5 | 6BT | |
| 7 | AM Converter | 12BE6 | 12BE6 | 7CH | |
| 8 | AM IF | 12BA6 | 12BA6 | 7BK | |
| 9 | AM Det.-AVC-AF | 12AT6 | 12AT6 | 7BT | |
| 10 | Power Output | 50L6GT | 50L6GT | 7AC | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | CLARION PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 11A | 40 | 300 | A18-284 | AF888D | UP4445 | DY-419* | EL-432* | ■ Filter |
| B | 40 | 300 | | | ⌐ | | | ▲ " |
| C | 40 | 150 | | | BR4015 | | | ▲ " |
| 12 | 4 | 150 | A18-273 | PRS150/4 | BR415 | M-8-150 | UT-41 | Stabilizing Cap. |
| 13 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Line Filter |
| 14 | .005 | 600 | A16-153 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Output Plate Bypass |
| 15 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Tone Compensation |
| 16 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | " " |
| 17 | .005 | 600 | A16-153 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Audio Coupling |
| 18 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Bypass Pwr. Supply |
| 19 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Audio Coupling |
| 20 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | AVC Filter |
| 21 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Ext. Ant. Isolation |
| 22 | .002 | 200 | A16-178 | 484-002 | DT4D2 | ST-6-002 | TC-22 | Audio Coupling |
| 23 | .02 | 400 | A16-150 | 484-02 | DT4S2 | ST-4-02 | TC-12 | Tone Compensation |
| 24 | .1 | 200 | A16-157 | 484-.1 | DT2P1 | ST-2-1 | TC-1 | AVC Filter |
| 25 | .003 | 200 | A16-160 | 484-003 | DT6D3 | ST-6-003 | TC-23 | De-emphasis |
| 26 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 3rd FM IF Cathode Bypass |
| 27 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Bypass Power Supply |
| 28 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 2nd FM IF Cathode Bypass |
| 29 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Bypass Pwr. Supply |
| 30 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | 1st FM IF Cathode Bypass |
| 31 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | RF Bypass Pwr. Supply |
| 32 | 100 | 300 | A15-196 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | AF Plate Bypass-Cer. |
| 33 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | AF Plate Decoupling-Cer. |
| 34 | 250 | | A15-176 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | Diode RF Filter |
| 35 | 5 | | | 1469-000005 | 5R5V5 | MOS.5-55 | MS-55 | Fixed Trimmer-Cer. |
| 36 | 50 | | A15-191 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | AM Osc. Grid Cap.-Cer. |
| 37 | 50 | | A15-191 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Coupling-Cer. |
| 38 | 250 | | A15-176 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | RF Bypass |
| 39 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 3rd FM IF Plate Decoup.-Cer. |
| 40 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 3rd FM IF Screen Byp.-Cer |
| 41 | 470 | | A15-200 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | 3rd FM IF Grid Filter |
| 42 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd FM IF Plate Decoup.-Cer. |
| 43 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 2nd FM IF Cath. Byp.-Cer. |
| 44 | 470 | | A15-200 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | AVC Filter |
| 45 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st FM IF Plate Decoup. " |
| 46 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | 1st FM IF Screen Byp. " |
| 47 | 470 | | A15-200 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | AVC Filter |
| 48 | 20 | | A15-193 | | 5R5Q2 | MOS.5-42 | MS-42 | FM Conv. Plate Byp.-Cer. |
| 49 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | FM Conv. Plate Decoup. " |
| 50 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | FM Conv. Screen Byp. " |
| 51 | 50 | | A15-191 | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Fixed Pad " |
| 52 | 10 | | A15-197 | 1468-00001 | 5W5Q1 | MO.5-41 | MS-41 | FM Osc. Grid Cap. " |
| 53 | 20 | | A15-198 | | 5W5Q2 | MO.5-42 | MS-42 | RF Coupling " |
| 54 | 75 | | A15-195 | 1469-000075 | | | 1FM-475 | Fixed Pad " |
| 55 | 20 | | A15-198 | | 5W5Q2 | MO.5-42 | MS-42 | RF Coupling " |
| 56 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | RF Screen Bypass " |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CLARION PART No. | IRC PART No. | |
| 105 | 10 Meg. | ½ | A60-735 | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 106 | 270KΩ | ½ | A60-747 | BTS-270K | Red-Vi.-Yl. AF Plate Load |
| 107 | 270KΩ | ½ | A60-747 | BTS-270K | Red-Vi.-Yl. AF Plate Decoup. |
| 108 | 2.2 Meg. | ½ | A60-726 | BTS-2.2 Meg. | Red-Red-Grn. Bias Network |
| 109 | 470KΩ | ½ | A60-731 | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 110 | 150Ω | 1 | A60-741 | BW-1-150 | Br.-Grn.-Br. Output Cathode |
| 111 | 12KΩ | 1 | A60-751 | BTS-12K | Br.-Red-Or. Output Cathode Dropping |
| 112 | 100Ω | 1 | A60-755 | BW-1-100 | Br.-Blk.-Br. Filter |
| 113 | | | A60-734 | | Line Dropping-See Note |
| 114 | | | A60-735 | | " " " " |
| 115 | 15Ω | 3 | A60-738 | AB-15 | Br.-Grn.-Blk. Surge Limiter |

Note-Special compensating resistors. Do not use ordinary replacements.

## FILTER CHOKE

| ITEM NO. | RATINGS | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | TOTAL DIRECT CURRENT | D. C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 ~) | CLARION PART NO. | STANCOR PART NO. | THORDARSON PART NO. | MERIT PART No. | |
| 116 | 111 MA. | 166Ω | 4.5 Henries | A33-225 | | T-20C54‡ | | ‡Drill one new mounting hole. |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | CLARION PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 117 | 4000Ω | 3.2Ω | 600Ω | .6Ω | A80-234 | A-3823 | T22S46§ | A-2001 | §Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | CLARION PART No. | JENSEN PART No. | QUAM PART No. | |
| 118 | FIELD | VC IMP. | B78-354 | ST-110# | 6A21† | #Trim flange. |
| | PM | 3.2Ω | | Mod. P6-V | | †Drill and tap magnet frame. |
| 119 | CONE DIA. 6" | VC DIA. 9/16" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | CLARION PART No. | MEISSNER PART No. | |
| 120 | BC Ant. Coil | 2.7Ω | 57Ω | A10-507 | | |
| 121 | FM " " | .2Ω | .2Ω | SB10-488 | 14-1056 | |
| 122 | FM Plate Choke | | .6Ω | A33-226 | | |
| 123 | FM RF Coil | | 0Ω | B10-489 | | |
| 124 | BC Osc. Coil | .9Ω | 5.2Ω | B10-491 | 14-1060 | |
| 125 | FM " " | | 0Ω | B10-490 | | |
| 126 | AM 1st IF | 17.3Ω | 20Ω | A10-499 | 16-6678 | |
| 127 | FM 1st IF | .8Ω | .1Ω | SA10-493 | | |
| 128 | AM 2nd IF | 15.8Ω | 16.7Ω | A10-500 | 16-6678 | |
| 129 | FM 2nd IF | .8Ω | .1Ω | SC10-494 | | |
| 130 | FM 3rd IF | .8Ω | .1Ω | SC10-494 | | |
| 131 | FM Ratio Det. | 1.5Ω | .3Ω | SC10-492 | | |
| 132 | Filament Chk. | | .6Ω | A33-226 | | |
| 133 | " " | | .6Ω | A33-226 | | |
| 134 | " " | | .6Ω | A33-226 | | |
| 135 | " " | | .6Ω | A33-226 | | |
| 136 | " " | | .6Ω | A33-226 | | |
| 137 | " " | | .6Ω | A33-226 | | |
| 138 | " " | | .1Ω | A33-227 | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | CLARION PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | | |
| 57 | 470 | | A15-200 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | RF Cathode Bypass | Cer. |
| 58 | 50 | | A15-191 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Coupling | " |
| 59 | 50 | | A15-191 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Bypass | " |
| 60 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Line Filter | " |
| 61 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Filament Bypass | " |
| 62 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 63 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 64 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 65 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 66 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 67 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 68 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 69 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | RF Bypass | " |
| 70 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Filament Bypass | " |
| 71 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 72 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 73 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |
| 74 | 5000 | | A16-177 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | " " | " |

*Omit bypass section.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CLARION PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 75A | 1 Meg. | ½ | B24-173 | D13-137X | AT-109 | Volume Control tapped @ 300KΩ |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 75A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CLARION PART No. | IRC PART No. | |
| 76 | 1 Meg. | ½ | A60-688 | BTS-1 Meg. | Br.-Blk.-Grn. FM RF Grid |
| 77 | 68Ω | ½ | A60-742 | | Blue-Gray-Blk. FM RF Cathode |
| 78 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM RF Screen |
| 79 | 22KΩ | ½ | A60-744 | BTS-22K | Red-Red-Or. FM Conv. Grid |
| 80 | 22KΩ | ½ | A60-744 | BTS-22K | Red-Red-Or. FM Osc. Grid |
| 81 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM Conv. Screen |
| 82 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM Conv. Plate Decoup. |
| 83 | 100KΩ | ½ | A60-727 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 84 | 68Ω | ½ | A60-742 | | Blue-Gray-Blk. FM 1st IF Cathode |
| 85 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM 1st IF Screen |
| 86 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM 1st IF Plate Decoup. |
| 87 | 100KΩ | ½ | A60-727 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 88 | 68Ω | ½ | A60-742 | | Blue-Gray-Blk. FM 2nd IF Cathode |
| 89 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM 2nd IF Screen |
| 90 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM 2nd IF Plate Decoup. |
| 91 | 100KΩ | ½ | A60-727 | BTS-100K | Br.-Blk.-Yl. FM 3rd IF Grid |
| 92 | 68Ω | ½ | A60-742 | | Blue-Gray-Blk. FM 3rd IF Cathode |
| 93 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM 3rd IF Screen |
| 94 | 100Ω | ½ | A60-743 | | Br.-Blk.-Br. FM 3rd IF Plate Decoupling |
| 95 | 270Ω | ½ | A60-723 | | Red-Vi.-Br. RF Filter |
| 96 | 27KΩ | ½ | A60-748 | BTS-27K | Red-Vi.-Or. De-emphasis |
| 97 | 22KΩ | ½ | A60-744 | BTS-22K | Red-Red-Or. FM Det. Load |
| 98 | 100KΩ | ½ | A60-727 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 99 | 33KΩ | ½ | A60-748 | BTS-33K | Or.-Or.-Or. Tone Comp. |
| 100 | 1 Meg. | ½ | A60-688 | BTS-1 Meg. | Br.-Blk.-Grn. AM Conv. Grid |
| 101 | 22KΩ | ½ | A60-744 | BTS-22K | Red-Red-Or. AM Osc. Grid |
| 102 | 68Ω | ½ | A60-742 | BW-½-68 | Blue-Gray-Blk. AM IF Cathode |
| 103 | 2.2 Meg. | ½ | A60-726 | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 104 | 470KΩ | ½ | A60-731 | BTS-470K | Yl.-Vi.-Yl. Diode Load |

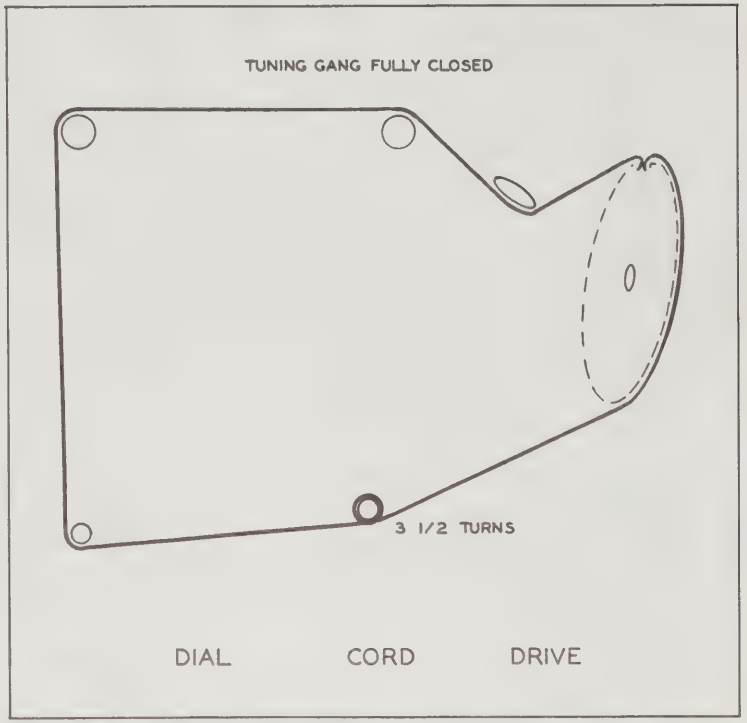
# PARTS LIST AND DESCRIPTIONS (Continued)

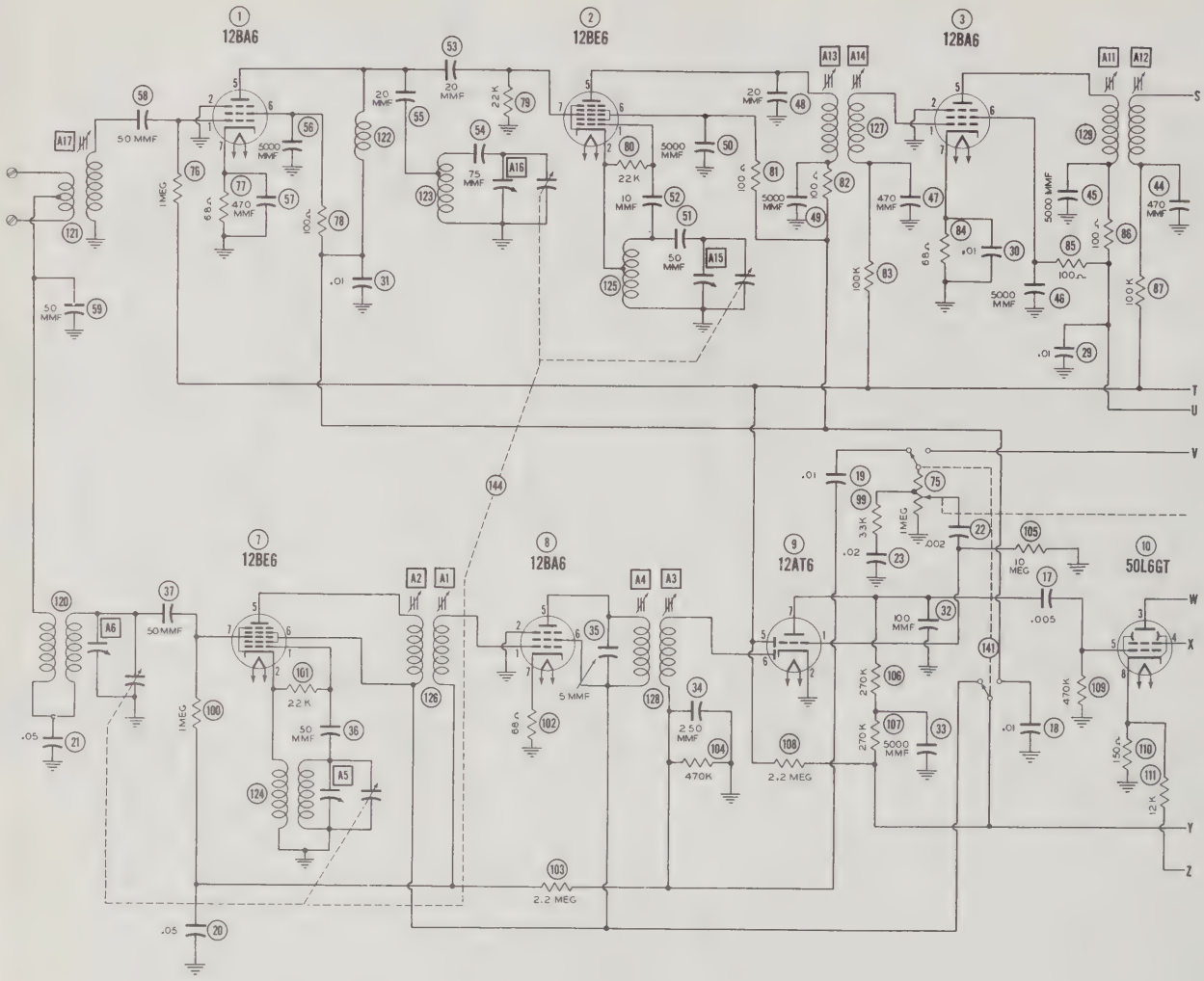
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | CLARION PART No. | | |
| 139 | Bayonet | 6-8 | 0.15 | Brown | | | Type 47 |
| 140 | " | 6-8 | 0.15 | " | | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | CLARION PART No. | NOTES |
|---|---|---|---|
| 141 | Switch | A69-181 | Band |
| 142 | " | A26-125 | Tone |
| 143 | Rectifier | A83-463 | Selenium (150 MA) |
| 144 | Tuning Gang | C19-191 | AM (30-535MMF, 40-220MMF) |
| A5 | Trimmer Strip | A20-144 | BC Osc. Adj. |
| A15 | | | FM Osc. Adj. |
| A16 | | | FM RF Adj. |
| A6 | Trimmer | A20-139 | BC Ant. Adj. |
| | Cabinet | A42-401 | Ivory |
| | " | D42-379 | Walnut |
| | Dial Scale | C67-511 | |
| | Dial Pointer | A56-65 | |
| | Knob | A52-191 | Ivory |
| | " | A52-187 | Walnut |






VOLTAGE READINGS

| | Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| ‡ | 1 | 12BA6 | -.3VDC | 0V. | 44VAC | 31.5VAC | 95VDC | 95VDC | .9VDC | - |
| ‡ | 2 | 12BE6 | -2.2VDC§ | 0V. | 17.6VAC | 6.4VAC | 95VDC | 95VDC | -.6VDC | - |
| ‡ | 3 | 12BA6 | 0V. | 0V. | 44.5VAC | 54VAC | 93VDC | 95VDC | 1VDC | - |
| ‡ | 4 | 12BA6 | 0V. | 0V. | 55VAC | 68VAC | 93VDC | 95VDC | .9VDC | - |
| ‡ | 5 | 12BA6 | 0V. | 0V. | 18VAC | 30VAC | 95VDC | 95VDC | 1VDC | - |
| ‡ | 6 | 6AL5 | 0V. | -4.6VDC | 0V. | 6.2VAC | -11VDC | 0V. | -.1VDC | - |
| | 7 | 12BE6 | -12VDC§ | 0V. | 31VAC | 19VAC | 97VDC | 97VDC | 0V. | - |
| | 8 | 12BA6 | 0V. | 0V. | 82VAC | 68VAC | 97VDC | 97VDC | .1VDC | - |
| | 9 | 12AT6 | -.5VDC | 0V. | 19VAC | 6.4VAC | -.3VDC | 0V. | 42VDC | - |
| | 10 | 50L6 | 0V. | 30VAC | 83VDC | 97VDC | 0V. | 70VDC | 78VAC | 6VDC |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| | Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| ‡ | 1 | 12BA6 | 1.1 Meg. | 0Ω | 35Ω | 26Ω | 12KΩ | 12KΩ | 68Ω | - |
| ‡ | 2 | 12BE6 | 22KΩ | 0Ω | 15Ω | 4Ω | 12KΩ | 12KΩ | 22KΩ | - |
| ‡ | 3 | 12BA6 | 220KΩ | 0Ω | 39.6Ω | 5Ω | 12KΩ | 12KΩ | 68Ω | - |
| ‡ | 4 | 12BA6 | 220KΩ | 0Ω | 51.6Ω | 6Ω | 12KΩ | 12KΩ | 68Ω | - |
| ‡ | 5 | 12BA6 | 100KΩ | 0Ω | 15.6Ω | 2Ω | 12KΩ | 12KΩ | 68Ω | - |
| ‡ | 6 | 6AL5 | 0Ω | 22KΩ | 0Ω | 3.4Ω | 115KΩ | 0Ω | 115KΩ | - |
| | 7 | 12BE6 | 22KΩ | .9Ω | 27.4Ω | 15.6Ω | 12KΩ | 12KΩ | 4 Meg. | - |
| | 8 | 12BA6 | 2.7 Meg. | 0Ω | 78Ω | 6Ω | 12KΩ | 12KΩ | 68Ω | - |
| | 9 | 12AT6 | 10 Meg. | 0Ω | 16Ω | 4Ω | 470KΩ | 120KΩ | 550KΩ | - |
| | 10 | 50L6 | INF. | 27Ω | 12KΩ | 12KΩ | 500KΩ | 230KΩ | 87Ω | 150Ω |

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

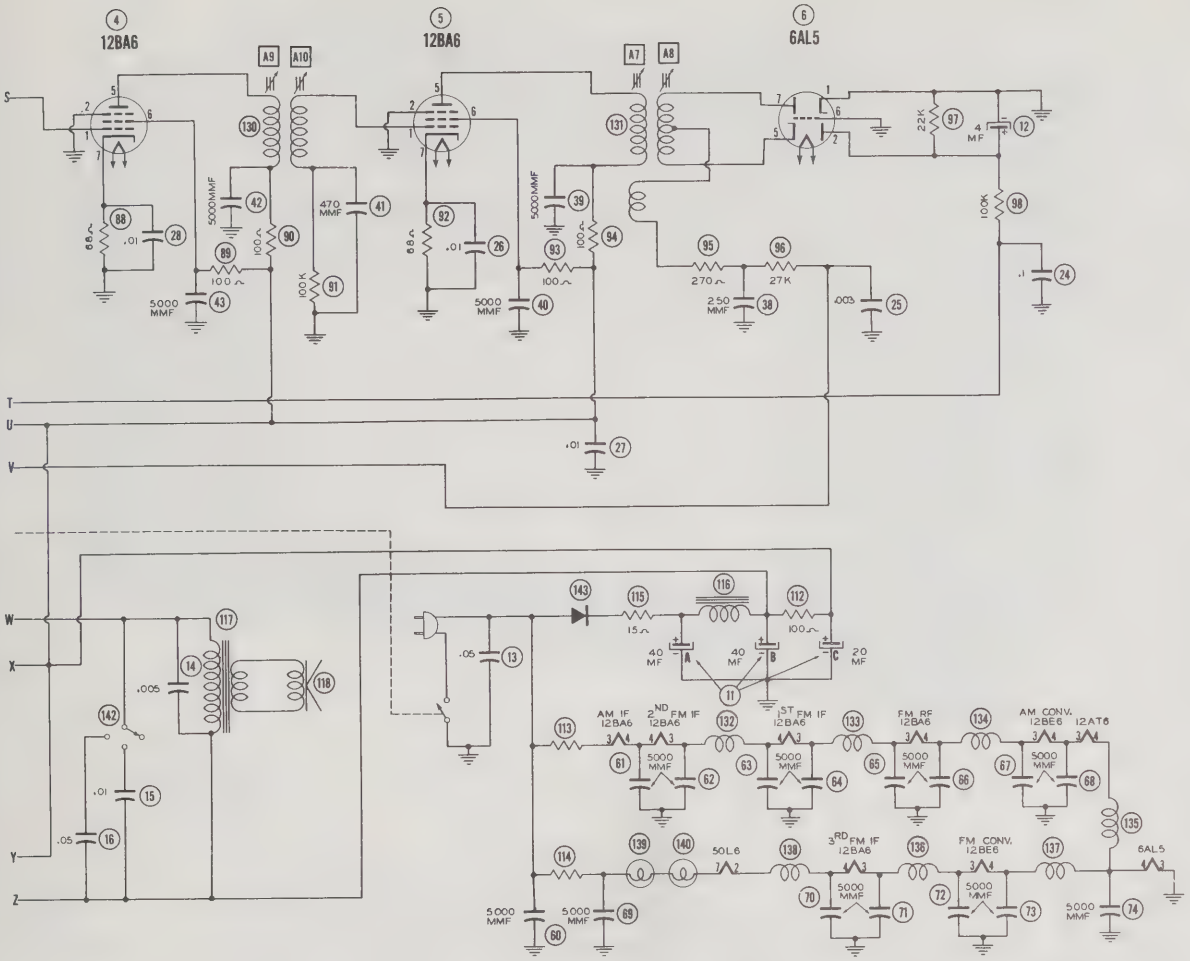
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948




IF=455 KC AM

IF=10.7 MC FM

| STAGE GAIN MEASUREMENTS | | | |
|---|---|---|---|
| ANTENNA TO CONVERTER GRID | 2X | | 600KC |
| CONVERSION GAIN | 20X | IN | 600KC |
| | | OUT | 455KC |
| INPUT IF TRANSFORMER | 1.5X | | 455KC |
| IF TUBE | 140X | | 455KC |
| OUTPUT IF TRANSFORMER | .4X | | 455KC |
| AUDIO | 20X | | 400 ~ |
| OUTPUT | 14X | | 400 ~ |

**The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.**


© Howard W. Sams & Co., Inc. 1948

## ALIGNMENT INSTRUCTIONS--READ CARFFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with side of signal generator and chassis.

Use insulated alignment screwdriver for all adjustments

## AM ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .1 MFD | High side to Pin 7 (grid) of 12BE6 AM Conv. Tube (7). Low side to chassis. | 1400KC | BC (Clock-wise) | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation. |
| 2 | 250MMFD | " | 1000KC | " | " | " | A5 | Adjust for maximum output |
| 3 | 250MMFD | High side to either dipole terminal. Low side to chassis. | 1400KC | " | Tune for maximum output. | " | A6 | " " " " |

## FM ALIGNMENT USING FM SIGNAL GENERATOR, OSCILLOSCOPE & OUTPUT METER

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep with exception of RF alignment Steps 7, 8 & 9 where 400 ∿ modulation with 45KC sweep is used. Connect the synchronized sweep voltage from the sig. gen. to the horizontal input of scope. The horizontal sweep voltage may be taken from the power line if the sig. gen. does not have a sync. voltage output. There may be some phase shift encountered between sig. gen. and scope horizontal sweep. If provision is made for this in the scope rotate phase control until the two curves coincide. If no provision is made for this the same thing may be accomplished by inserting a cap. of suitable value (.01 to .1 MFD) in series with the horizontal sync. input.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4 | .1 MFD. | High side to Pin 1 (grid) of 12BA6 2nd FM IF Tube (4). Low side to chassis. | 10.7MC (Freq. Mod.) | FM (Counter-Clockwise) | Tuning cap. fully open. | Vertical input to Point Ⓐ. Ground to chassis. | A7,A8 | Alternately adjust A7 for maximum amplitude and A8 for maximum linearity of "S" curve with curve centered on horizontal scope sweep line per Fig. 1. |
| 5 | .1 MFD. | High side to Pin 1 (grid) of 12BA6 FM RF Tube (1). Low side to chassis. | " | " | " | Vertical input to Point Ⓑ. Ground to chassis. | A9,A10 A11,A12 | Connect short from junction of cap. (24) and resistor (98) to chassis. Adjust for maximum amplitude and symmetry of pattern per Fig. 2 with pattern centered on horizontal scope sweep line. |
| 6 | .1 MFD. | High side to Pin 5 (plate) of 12BA6 FM RF Tube (1). Low side to chassis. | " | " | " | " | A13, A14 | Adjust for maximum amplitude and symmetry of pattern per Fig. 3 with pattern centered on horizontal scope sweep line. Remove short from junction of resistor (98) and cap. (24) to chassis. |
| | | | | | | OUTPUT METER | | |
| 7 | 2 -150Ω carbon res. | Each side in series with 150Ω resistor across dipole ant. terminals. | 108MC (Freq. Modulated 400 ∿ mod. 45KC sweep) | FM | Tuning cap. fully open. | Across voice coil | A15 | Adjust for maximum output |
| 8 | " | " | 103MC | " | Tune for maximum output. | " | A16 | " " " " |
| 9 | " | " | 100MC | " | " | " | A17 | " " " " |

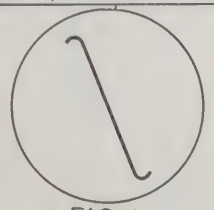


FIG. 1

FIG. 2

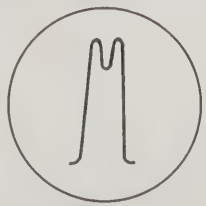


FIG. 3

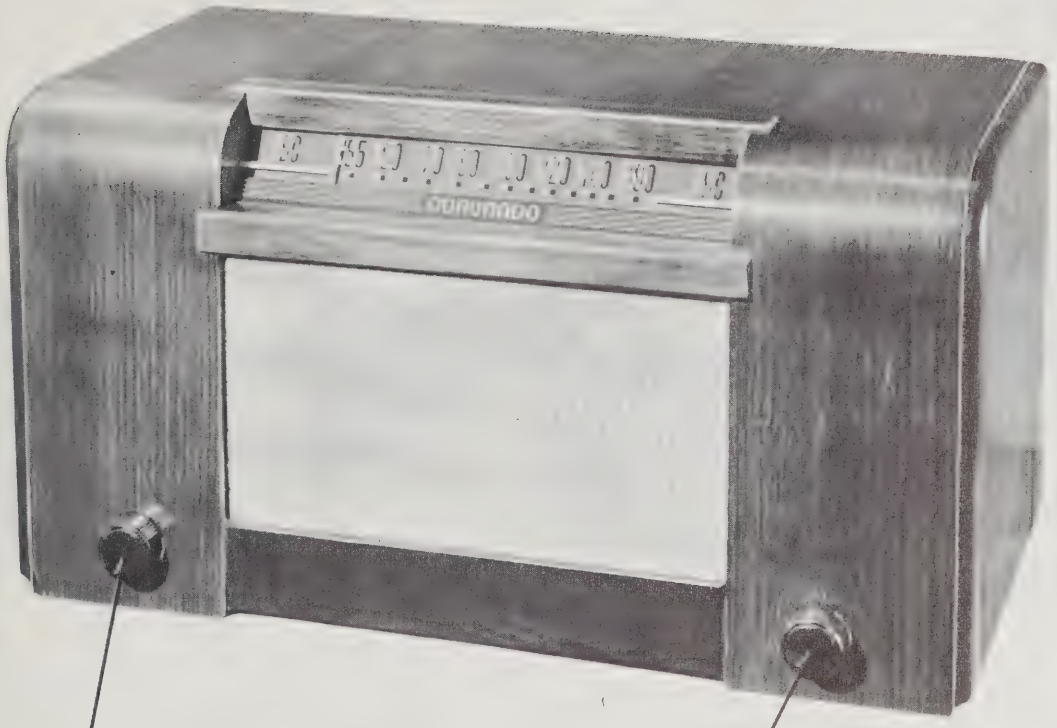
## FM ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

For plotting discriminator curve, vary sig. gen. 100KC above and below 10.7MC in Steps of 20KC. Record readings of VTVM for each setting of sig. gen. and plot curve. If curve is not similar to Fig. 1 repeat adjustment of A7 and A8 and replot curve.

For plotting IF curve, vary sig. gen. 150KC above and below 10.7MC in Steps of 20KC. Record readings of VTVM for each setting of sig. gen. and plot curve. If curve is not similar to Fig. 2 or Fig. 3 repeat last adjustments and replot curve.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4 | .1 MFD. | High side to Pin 1 (grid) of 12BA6 3rd FM IF Tube (5). Low side to chassis. | 10.7MC (Unmodulated) | FM | Tuning cap. fully open. | DC probe to Point Ⓐ. Common to chassis | A7 | Adjust for maximum deflection. |
| 5 | .1 MFD. | " | " | " | " | DC probe to Point Ⓐ. Common to chassis | A8 | Adjust for zero deflection. Plot discriminator curve per prealignment instructions. Once curve is satisfactory do not disturb adjustment of A7 or A8. |
| 6 | .1 MFD. | High side to Pin 1 (grid) of 12BA6 2nd FM IF Tube (4). Low side to chassis. | " | " | " | DC probe to Point Ⓐ. Common to chassis | A9,A10 | Solder a shunt cap. of 100 MMFD across secondary of 3rd FM IF Transformer (131).and adjust A9 for maximum deflection. Transfer shunting cap. to primary of the same transformer and adjust A10 for maximum deflection. Plot IF curve per prealignment instructions Once curve is satisfactory do not disturb adjustment of A9 or A10. Remove shunt cap. |
| 7 | .1 MFD. | High side to Pin 1 (grid) of 12BA6 1st FM IF Tube (3). Low side to chassis. | " | " | " | " | A11, A12 | Solder a shunt cap. of 100 MMFD across secondary of 2nd FM IF Transformer (130) and adjust A11 for maximum deflection. Transfer shunting cap. to primary of the same transformer and adjust A12 for maximum deflection. Plot IF curve per prealignment instructions. Once curve is satisfactory do not disturb adjustment of A11 or A12. Remove shunt cap. |
| 8 | .1 MFD. | High side to Pin 5 (plate) of 12BA6 FM RF Tube (1). Low side to chassis. | " | " | " | " | A13, A14 | Solder a shunt cap. of 100 MMFD across secondary of 1st FM IF Transformer (127) and adjust A13 for maximum deflection. Transfer shunting cap. to primary of the same transformer and adjust A14 for maximum deflection. Plot IF curve per prealignment instruction. Once curve is satisfactory do not disturb adjustment of A13 and A14. Remove shunt cap. |
| 9 | 2 -150Ω carbon res. | Each side in series with 150Ω resistor across dipole ant. terminals. | 108MC (Unmodulated) | FM | Tuning cap. fully open. | DC probe to Point Ⓑ. Common to chassis | A15 | Adjust for maximum deflection. |
| 10 | " | " | 103MC | " | Tune for maximum deflection. | " | A16 | Rock tuning cap. and adjust for maximum deflection. |
| 11 | " | " | 100MC | " | " | " | A17 | Adjust for maximum deflection. |

CORONADO MODEL 43-6485
BATTERY-OPERATED




CORONADO MODEL 43-6485
BATTERY-OPERATED

CORONADO MODEL 43-6485

| | |
|---|---|
| TRADE NAME | Coronado, Model 43-6485 |
| SUPPLIER | Gamble-Skogmo, Inc., 15 N. 8th St., Minneapolis, Minn. |
| TYPE SET | Battery Operated Superheterodyne Receiver with Loop Antenna |
| TUBES (FIVE) | Types, 1N5GT RF Amp., 1A7GT Converter, 1N5GT IF Amp., 1H5GT Det.-AVC-AF, 3Q5GT Power Output |
| POWER SUPPLY | 1.5 Volts "A" Supply and 90 Volts "B" Supply in Pack Form |
| RATING | 290 MA @ 1.5 Volts DC and 14MA @ 90 Volts DC |
| TUNING RANGE—BROADCAST | 540-1600KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to top cap. (grid) of 1A7. Low side to chassis. | 455KC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. |
| 2 | 200MMFD | High side to ext. ant. lead. Low side to chassis. | 1600KC | " | " | A5 | " " " " |
| 3 | 200MMFD | " | 1400KC | Tune for maximum output. | " | A6,A7 | " " " " |

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS



## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| | | CORONADO PART No. | STANDARD REPLACEMENT | | |
| 1 | RF Amp. | 1N5GT | 1N5GT | 5Y | |
| 2 | Converter | 1A7GT | 1A7GT | 7Z | |
| 3 | IF Amp. | 1N5GT | 1N5GT | 5Y | |
| 4 | Det.-AVC-AF | 1H5GT | 1H5GT | 5Z | |
| 5 | Power Output | 3Q5GT | 3Q5GT | 7AP | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | CORONADO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 6 | 16 | 150 | | PRS150/16 | BR1615 | M-16-150 | UT-161 | Power Supply Bypass |
| 7 | .005 | 600 | | 684-.005 | DT6D5 | ST-6-005 | TC-25 | Tone Comp. |
| 8 | .005 | 600 | | 684-.005 | DT6D5 | ST-6-005 | TC-25 | Audio Coupling |
| 9 | .005 | 600 | | 684-.005 | DT6D5 | ST-6-005 | TC-25 | " " |
| 10 | .05 | 200 | | 484-.05 | DT2S5 | ST-4-05 | TC-15 | Conv. Screen Bypass |
| 11 | .05 | 200 | | 484-.05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 12 | .05 | 200 | | 484-.05 | DT2S5 | ST-4-05 | TC-15 | " " |
| 13 | .01 | 400 | | 484-.01 | DT4S1 | ST-4-01 | TC-11 | Ext. Ant. Loading |
| 14 | 200 | 500 | | 1468-.0002 | 5W5T2 | MO.5-32 | 1FM-32 | AF Plate Bypass |
| 15 | 50 | 500 | | 1469-.00005 | 5R5Q5 | MOS.5-45 | MS-45 | Osc. Grid Cap. |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESIST-ANCE | WATTS | CORONADO PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 16A | 500KΩ | ½ | | D13-133 | M-60-Z | Volume Control |
| B | Shaft | | | A | Not Req. | Attach to 16A per instructions |
| C | Switch | | | 42 | SW-A2 | " " " " " |

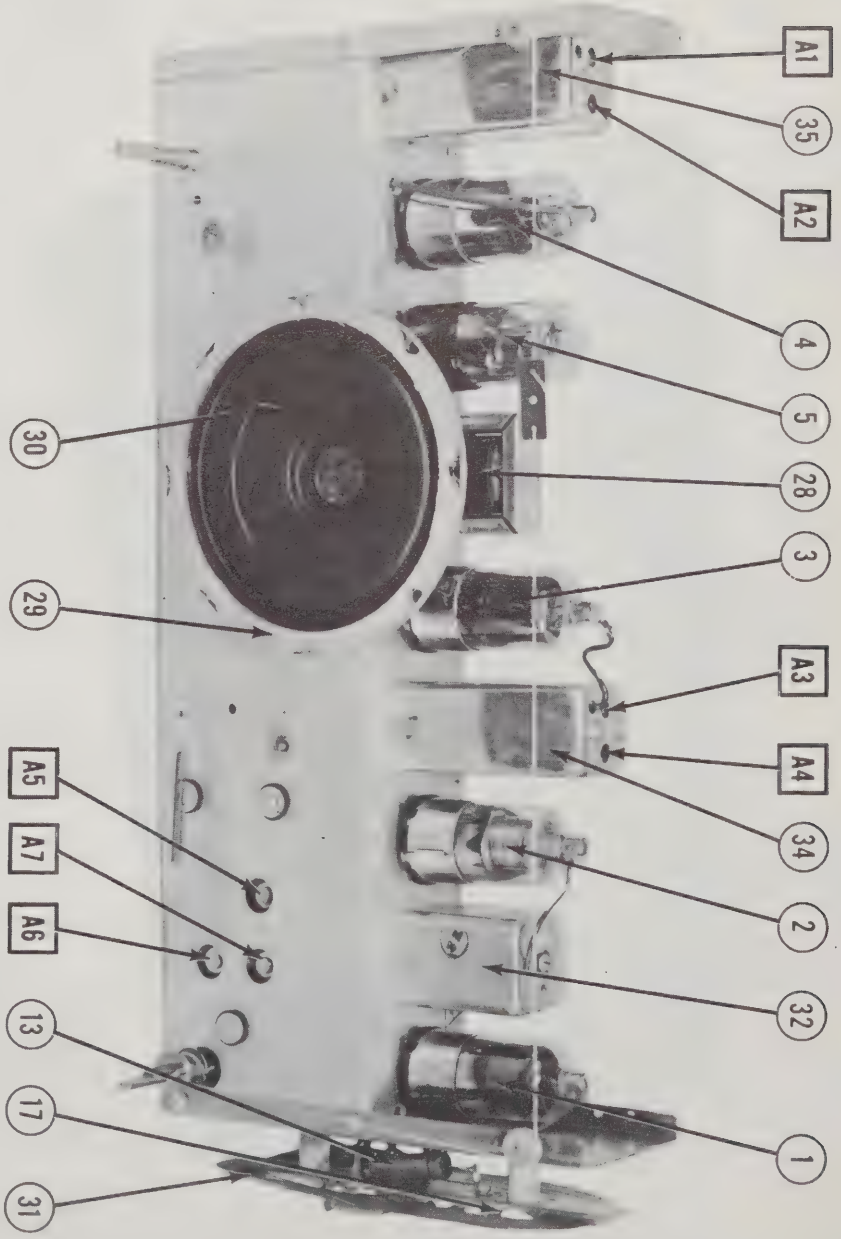
## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CORONADO PART No. | IRC PART No. | |
| 17 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red Antenna Loading |
| 18 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 19 | 150KΩ | ½ | | BTS-150K | Br.-Grn.-Yl. Osc. Grid |
| 20 | 33KΩ | ½ | | BTS-33K | Or.-Or.-Or. Conv. Screen |
| 21 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 22 | 15 Meg. | ½ | | BTS-15 Meg. | Br.-Grn.-Blue AF Grid |
| 23 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 24 | 2 Meg. | ½ | | BTS-2.2 Meg. | Red-Blk.-Grn. Output Grid |
| 25 | 470Ω | ½ | | BTS-470 | Yl.-Vi.-Br. Bias |
| 26 | .56Ω | ½ | | BW-½-.56 | Grn.-Blue-Silver Batt. Economizer Res. |
| 27 | 15KΩ | ½ | | BTS-15K | Br.-Grn.-Or. Tone Comp. |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | CORONADO PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 28 | 8700Ω | 3.1Ω | 470Ω | .4Ω | 25594A | A-3329‡ | T22S47‡ | A-2900‡ | ‡Bend mounting tabs down, file out slots and mount on original bracket. |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: CORONADO PART No. | JENSEN PART No. | QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 29 | FIELD PM | VC IMP. 3.1Ω | 51VN1 | ST-107# Mod. P5-V | 5A15# | #Drill and tap magnet frame. |
| 30 | CONE DIA. 4-9/16" | VC DIA. 9/16" | | | | |

## R F COILS

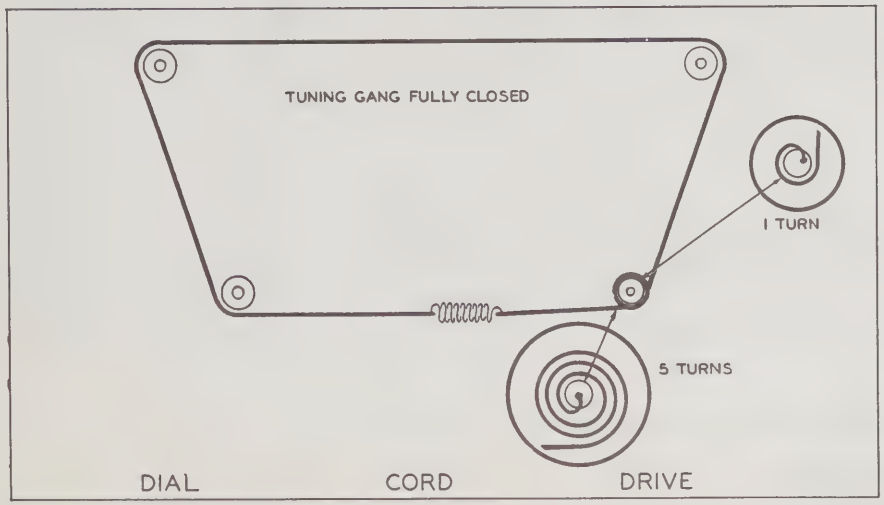
| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: CORONADO PART No. | MEISSNER PART No. | |
|---|---|---|---|---|---|---|
| 31 | Loop Ant. | .5Ω | 3Ω | | | |
| 32 | RF Coil | 70Ω | 6Ω | | | |
| 33 | Osc. Coil | 9Ω | 9Ω | | 14-1058 | |
| 34 | Input IF | 16Ω | 16Ω | | 16-6658 | |
| 35 | Output IF | 16Ω | | | 16-6670 | |

## BATTERIES

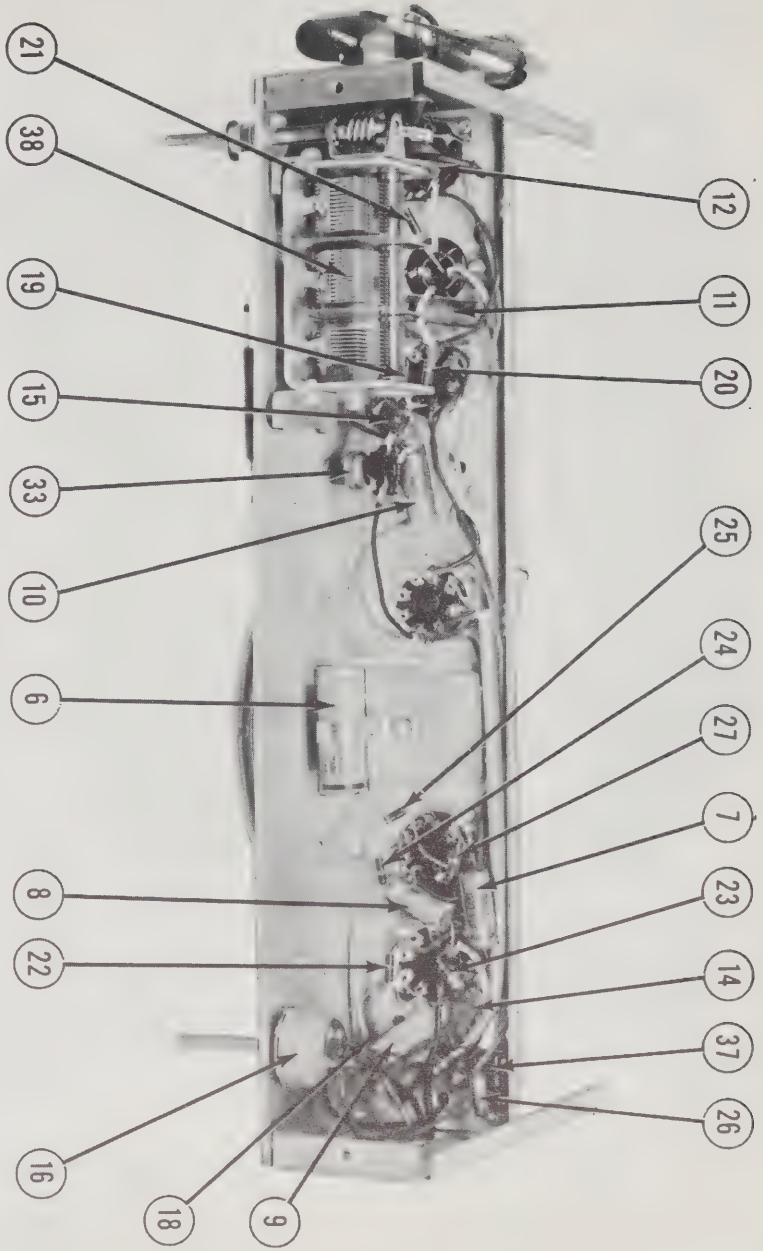
| ITEM No. | VOLTAGE | CORONADO PART No. | REPLACEMENT DATA: EVEREADY "A" | EVEREADY "B" | EVEREADY "A-B" | BURGESS "A" | BURGESS "B" | BURGESS "A-B" | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 36 | 1.5V "A" 90V "B" | | | | 758 | | | 17GD60 | |

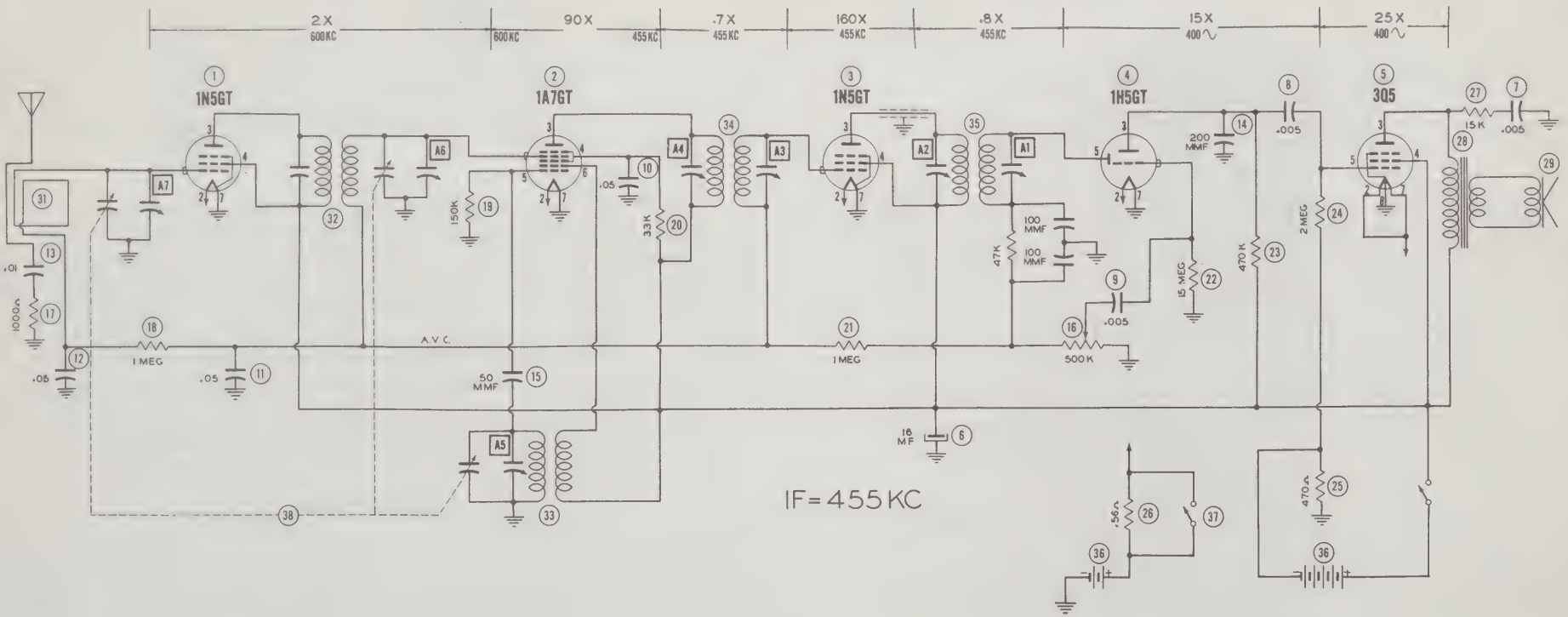
## MISCELLANEOUS

| ITEM No. | PART NAME | CORONADO PART No. | NOTES |
|---|---|---|---|
| 37 | Switch | | Economizer |
| 38 | 3 Gang Var. Cap. | | (26-223MMF, 26-433MMF, 17-463MMF) |




# CHASSIS—BOTTOM VIEW






VOLTAGE AND RESISTANCE READINGS TAKEN WITH BATTERY SWITCH IN NEW POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1N5GT | 0V. | 1.3VDC | 80VDC | 80VDC | 0V. | 0V. | 0V. | 0V. | -.2VDC |
| 2 | 1A7GT | 0V. | 1.3VDC | 80VDC | 50VDC | -11.5VDC§ | 80VDC | 0V. | 80VDC | -1.2VDC |
| 3 | 1N5GT | 0V. | 1.3VDC | 80VDC | 80VDC | 0V. | 0V. | 0V. | 0V. | 0V. |
| 4 | 1H5GT | 0V. | 1.3VDC | 65VDC | 80VDC | 0V. | 0V. | 0V. | 0V. | 0V. |
| 5 | 3Q5GT | 77VDC | 1.3VDC | 77VDC | 80VDC | -.8VDC | -5.6VDC | 1.3VDC | 0V. | - |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1N5GT | 0Ω | * | 80KΩ | 80KΩ | 2 Meg. | INF. | 0Ω | INF. | 2.5 Meg. |
| 2 | 1A7GT | 0Ω | * | 50KΩ | 110KΩ | 150KΩ | 80KΩ | 0Ω | 80KΩ | 1.5 Meg. |
| 3 | 1N5GT | 0Ω | * | 80KΩ | 80KΩ | INF. | INF. | 0Ω | 1.5 Meg. | 1.5 Meg. |
| 4 | 1H5GT | 0Ω | * | 550KΩ | 80KΩ | 550KΩ | 15 Meg. | 0Ω | 1.5 Meg. | 15 Meg. |
| 5 | 3Q5GT | 80KΩ | * | 80KΩ | 80KΩ | 2.2 Meg | 470Ω | * | 0Ω | - |

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1948

4816-9

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to chassis.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

GILFILLAN MODEL 68B-D
BATTERY-LINE OPERATED

GILFILLAN MODEL 68B-D
BATTERY-LINE OPERATED

GILFILLAN MODEL 68B-D

| | |
|---|---|
| **TRADE NAME** | Gilfillan, Models 68B-D |
| **MANUFACTURER** | Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles, Calif. |
| **TYPE SET** | Three Power Operated Portable Superheterodyne Receiver with Loop Antenna |
| **TUBES (SIX)** | Types, 1N5GT RF Amp., 1A7GT Converter. 1N5GT IF Amp., 1H5GT Det.-AVC-AF, 3Q5GT Power Output, 117Z3 Rectifier. |
| **POWER SUPPLY RATING** | 110-120 Volts AC-DC or 9 Volts "A" Supply and 90 Volts "B" Supply in Pack Form .15 Amp. @ 117 Volts AC or 54MA @ 9 Volts DC and 7.6MA @ 90 Volts DC |
| **TUNING RANGE—BROADCAST** | 540-1670KC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set pointer turn tuning cap. fully closed and set pointer parallel with base of dial. Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-. Loop should be maintained in samerelative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to top cap. (grid) of 1A7. Low side to B-. | 455KC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF to reduce hum modulation. |
| 2 | | Loop | 1400KC | 1400KC | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3 | | " | 1400KC | Tune for maximum output. | " | A6,A7 | Adjust for maximum output. |
| 4 | | " | 600KC | " | " | A8 | Rock tuning Cap and adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made. |

**HOWARD W. SAMS & CO., INC.** **Indianapolis Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

GILFILLAN
MODEL 68B-D

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: GILFILLAN PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 1N5GT | 1N5GT | 5Y | |
| 2 | Converter | 1A7GT | 1A7GT | 7Z | |
| 3 | IF Amp. | 1N5GT | 1N5GT | 5Y | |
| 4 | Det.-AVC-AF | 1H5GT | 1H5GT | 5Z | |
| 5 | Power Output | 3Q5GT | 3Q5GT | 7AP | |
| 6 | Rectifier | 117Z3 | 117Z3 | 4BR | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: GILFILLAN PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 7A | 50 | 150 | | [AF20D | [UP4CJ62 | DY-304 | | ■ Filter |
| B | 100 | 150 | | [PRSA302010# | [EZ5515# | M-2x50-150# | | ▲ " |
| C | 100 | 12 | | | | | | Filament Bypass |
| 8 | 100 | 25 | | PRS25/100 | BRH251 | M-100-25 | UHC-102 | " " |
| 9 | .05 | 200 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | Line Filter |
| 10 | .25 | 200 | | 484-.25 | DT2P25 | ST-2-25 | 72P3 | Line Isolation |
| 11 | .01 | 400 | | 484-01 | DT4S1 | ST-4-01 | TC-11 | Output Plate Bypass |
| 12 | .02 | 200 | | 484-02 | DT2S2 | ST-4-02 | TC-12 | Audio Coupling |
| 13 | .1 | 200 | | 484-.1 | DT2P1 | ST-2-1 | TC-1 | Audio Plate Decoupling |
| 14 | .005 | 600 | | 684-005 | DT6D5 | ST-6-005 | TC-25 | Audio Coupling |
| 15 | .01 | 400 | | 484-01 | DT4S1 | ST-4-01 | TC-11 | Conv. Screen Bypass |
| 16 | .1 | 200 | | 484-.1 | DT2P1 | ST-2-1 | TC-1 | RF Bypass Pwr. Supply |
| 17 | .05 | 200 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 18 | .05 | 200 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 19 | 100 | 500 | | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | AF Grid Bypass |
| 20 | 250 | 500 | | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | Diode Filter |
| 21 | 100 | 500 | | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | " " |
| 22 | 100 | 500 | | 1469-0001 | 5R5T1 | MOS.5-31 | MB-31 | Osc. Grid Cap. |

#Parallel sections to obtain desired capacity.

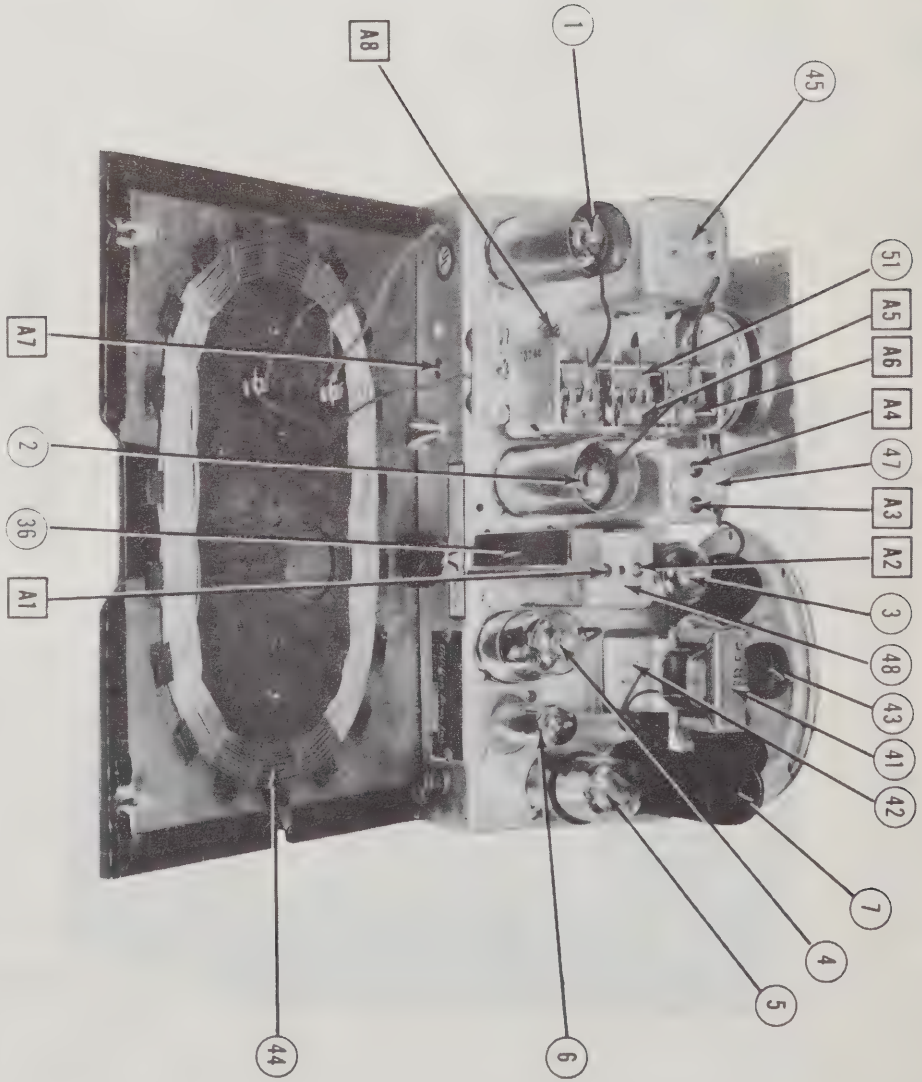
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: GILFILLAN PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 23A | 1 Meg. | ½ | 66B-2D | D13-137 | AM-63-Z | Volume Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 23A per instructions |
| C | Switch | | " " | 42 | SW-A2 | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: GILFILLAN PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 24 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 25 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. " " |
| 26 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | Red-Red-Grn. " " |
| 27 | 180KΩ | ½ | | BTS-180K | Br.-Gray-Yl. Osc. Grid |
| 28 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. Conv. Anode Dropping |
| 29 | 68KΩ | ½ | | BTS-68K | Blue-Gray-Or. Conv. Screen Dropping |
| 30 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network-See Note |
| 31 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Diode Filter |
| 32 | 10 Meg. | ½ | | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 33 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. AF Plate Load |
| 34 | 150KΩ | ½ | | BTS-150K | Br.-Grn.-Yl. AF Plate Decoup. |
| 35 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | Red-Red-Grn. Output Grid |
| 36A | 1800Ω | 10 | | AB-1800 | Filament Dropping |
| B | 400Ω | 10 | | AB-750 | Filter |
| 37 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. Line Isolation |
| 38 | 100Ω | ½ | | BW-½-100 | Br.-Blk.-Br. Fil. String |
| 39 | 100Ω | ½ | | BW-½-100 | Br.-Blk.-Br. " " |
| 40 | 220Ω | ½ | | BW-½-220 | Red-Red-Br. " " |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | GILFILLAN PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 41 | 6000Ω | 3.1Ω | 485Ω | .5Ω | 66B-56 | A-3848‡ | T22S47‡ | A-2998‡ | ‡Bend mounting tabs down, file out slots and mount on original bracket. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | GILFILLAN PART No. | JENSEN PART No. | QUAM PART No. | |
| 42 | FIELD | VC IMP. | 66B-55 | ST-105* Mod. P5-X | 5A15 | *Drill and tap magnet frame. |
| | PM | 3.1Ω | | | | |
| 43 | CONE DIA. | VC DIA. | | | | |
| | 4-5/8" | 9/16" | | | | |

## R F COILS

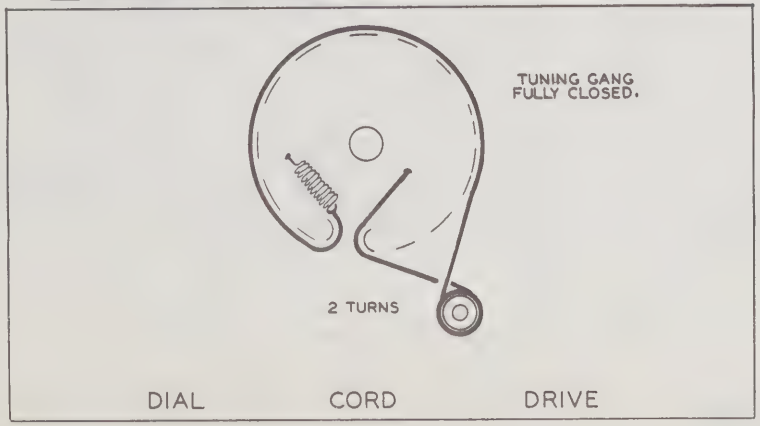
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | GILFILLAN PART No. | MEISSNER PART No. |
| 44 | Loop Ant. | | 1.8Ω | 67B-1 | |
| 45 | RF Coil | 82Ω | 4.4Ω | 66B-38-B | 14-7558 |
| 46 | Osc. Coil | 2.8Ω | 6.5Ω | 66B-20-B | 14-1060 |
| 47 | Input IF | 16.6Ω | 12.9Ω | 66B-36-B | 16-6662 |
| 48 | Output IF | 16.2Ω | 16.2Ω | 66B-36-B | 16-6660 |

## BATTERIES

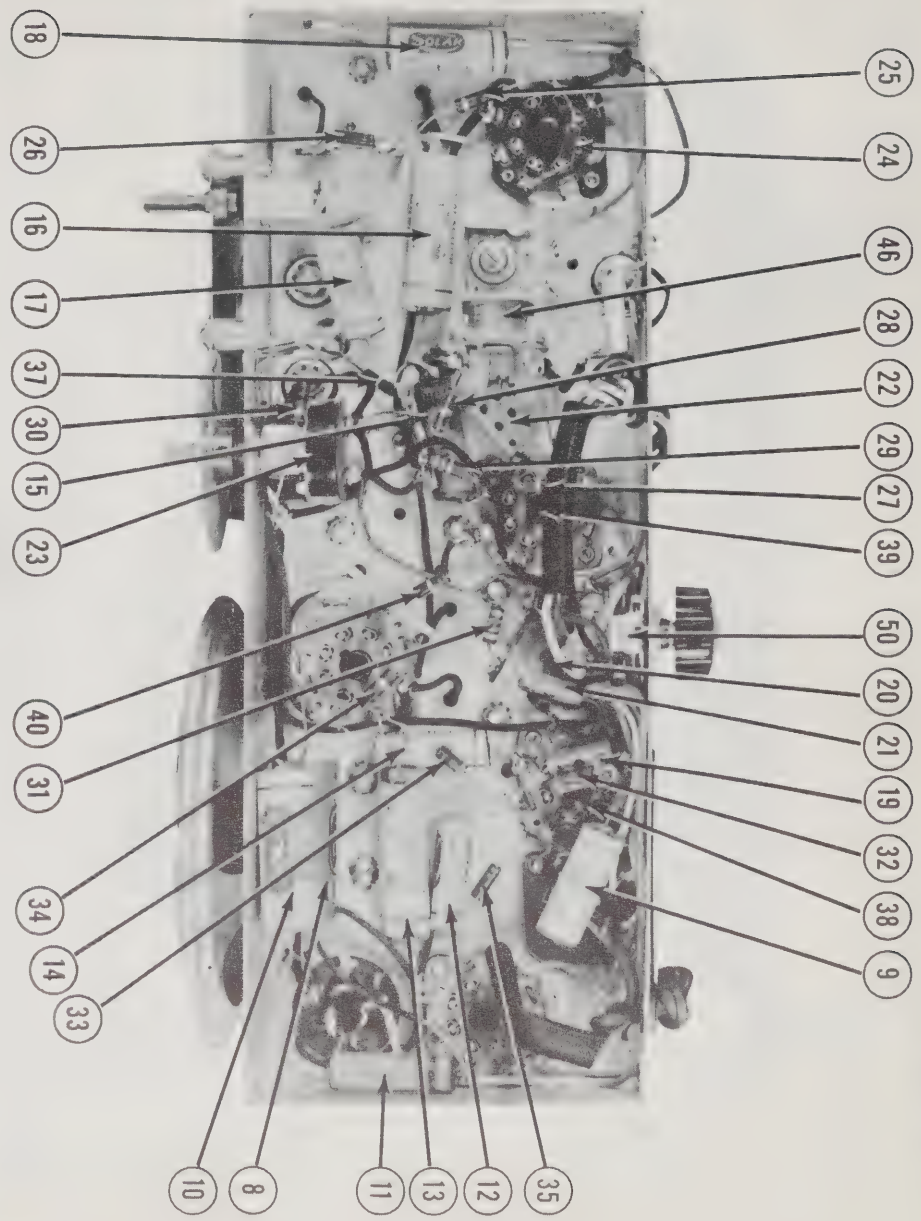
| ITEM No. | VOLTAGE | GILFILLAN PART No. | REPLACEMENT DATA | | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | EVEREADY | | | BURGESS | | | |
| | | | "A" | "B" | "A-B" | "A" | "B" | "A-B" | |
| 49 | 9V "A"<br>90V "B" | | | | #753 | | | F6A60 | |

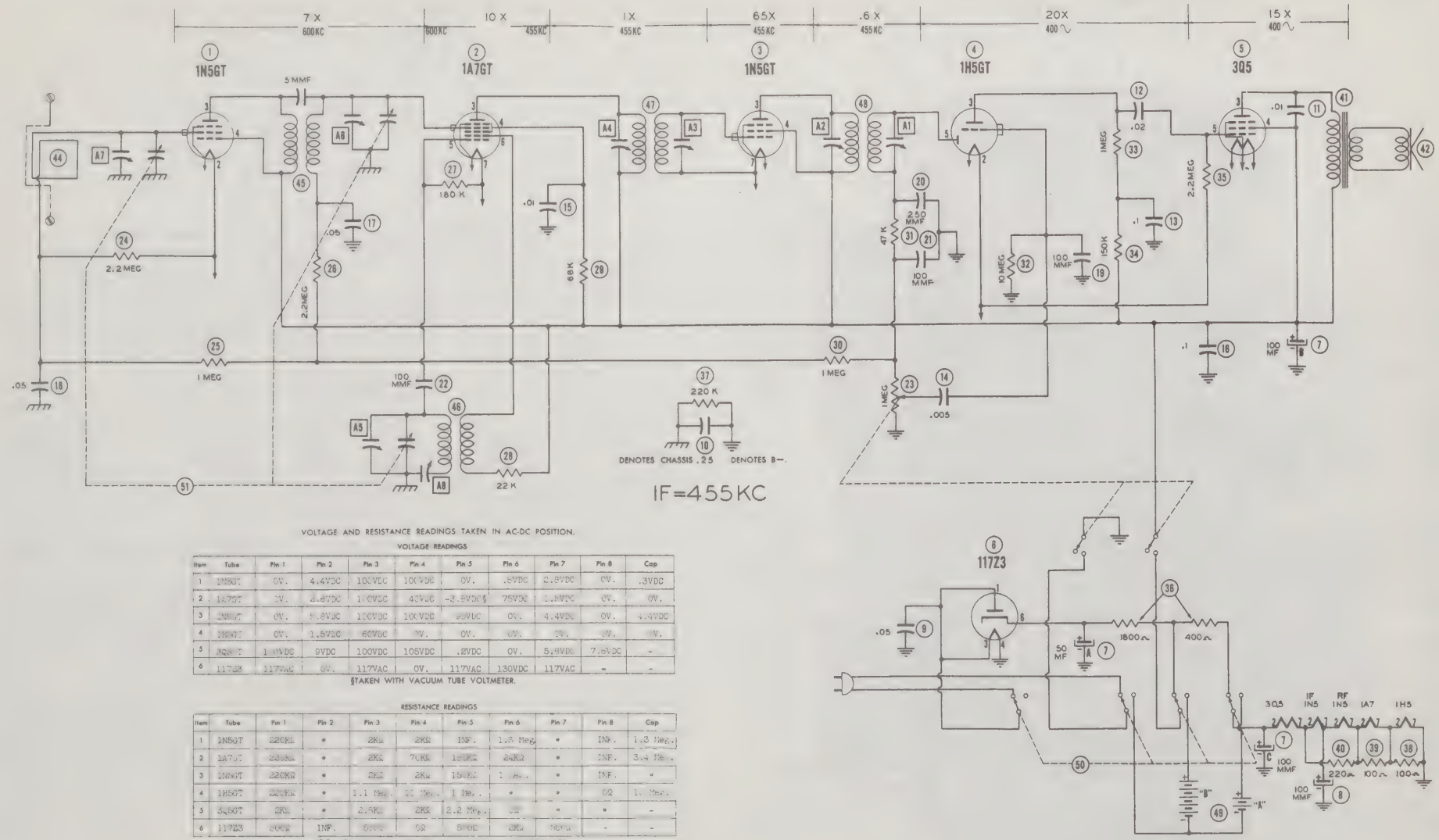
## MISCELLANEOUS

| ITEM No. | PART NAME | GILFILLAN PART No. | NOTES |
|---|---|---|---|
| 50 | Switch | | AC/DC Battery |
| 51 | 3 Gang Var. Cap<br>Dial Pointer | 66B-34-B<br>66B-72A | (50-410MMF) each section |




# CHASSIS—BOTTOM VIEW






VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1N5GT | 0V. | 4.4VDC | 100VDC | 100VDC | 0V. | .5VDC | 2.8VDC | 0V. | .3VDC |
| 2 | 1A7GT | 0V. | 2.8VDC | 1.0VDC | 43VDC | -3.5VDC§ | 75VDC | 1.5VDC | 0V. | 0V. |
| 3 | 1N5GT | 0V. | 5.8VDC | 100VDC | 100VDC | 80VDC | 0V. | 4.4VDC | 0V. | 4.4VDC |
| 4 | 1H5GT | 0V. | 1.8VDC | 86VDC | 0V. | 0V. | 0V. | 0V. | 0V. | 0V. |
| 5 | 3Q5GT | 1.0VDC | 9VDC | 100VDC | 105VDC | .2VDC | 0V. | 5.8VDC | 7.6VDC | - |
| 6 | 117Z3 | 117VAC | 0V. | 117VAC | 0V. | 117VAC | 130VDC | 117VAC | - | - |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1N5GT | 220KΩ | * | 2KΩ | 2KΩ | INF. | 1.3 Meg. | * | INF. | 1.3 Meg. |
| 2 | 1A7GT | 220KΩ | * | 2KΩ | 70KΩ | 120KΩ | 24KΩ | * | INF. | 3.4 Meg. |
| 3 | 1N5GT | 220KΩ | * | 2KΩ | 2KΩ | 150KΩ | 1 Meg. | * | INF. | * |
| 4 | 1H5GT | 220KΩ | * | 1.1 Meg. | 1.1 Meg. | 1 Meg. | * | * | 0Ω | 1.1 Meg. |
| 5 | 3Q5GT | 2KΩ | * | 2.5KΩ | 2KΩ | 2.2 Meg. | 0Ω | * | * | - |
| 6 | 117Z3 | 300Ω | INF. | 300Ω | 0Ω | 300Ω | 2KΩ | 300Ω | - | - |

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

4816-10

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting across volume control.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volts.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

GILFILLAN MODEL
68F

GILFILLAN MODEL
68F

GILFILLAN MODEL 68F

| | |
|---|---|
| **TRADE NAME** | Gilfillan, Model 68F |
| **MANUFACTURER** | Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles, Calif. |
| **TYPE SET** | AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna |
| **TUBES** (SIX) | Types, 12AT7 FM Converter, 12BE6 AM Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 35L6GT Power Output, 35W4 Rectifier. |
| **POWER SUPPLY** | 110-120 Volts AC-DC — RATING .24 Amp. @ 117 Volts AC |
| **TUNING RANGE—BROADCAST** | 540-1640KC — FREQ. MOD. 88 - 108MC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set dial pointer turn tuning cap. fully open and set pointer to last reference mark at high frequency end of dial.

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | 50 MMFD | High side to ext. AM ant. lead. Low side to B-. | 455KC | AM | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. |
| 2 | 50 MMFD | " | 1500KC | " | 1500KC | " | A5 | " " " " |
| 3 | 50 MMFD | " | " | " | Tune for maximum output. | " | A6 | " " " " |
| 4 | Direct | High side to red ant. lead. Low side to chassis. | 21.75MC (AM modulation) | FM | Tuning cap. fully open. | " | A7 | " " " " |
| 5 | | Sig. gen. output lead near receiver. | 108MC (Unmodulated) | " | 108MC | " | A8 | Adjust for minimum noise. |
| 6 | | " | " | " | Tune for minimum noise | " | A9 | Rock tuning cap. and adjust for minimum noise. |
| 7 | | " | 88MC | " | " | " | | Compress or expand FM Osc. 62 and FM ant. 60 coils slightly for minimum noise. Repeat Steps 6 & 7 until no further improvement can be made. |

**HOWARD W. SAMS & CO., INC.** • **Indianapolis, Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc."

Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

GILFILLAN MODEL 68F

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: GILFILLAN PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | FM Converter | 12AT7 | 12AT7 | | |
| 2 | AM Converter | 12BE6 | 12BE6 | 7CH | |
| 3 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| 4 | Det.-AVC-AF | 12AT6 | 12AT6 | 7BT | |
| 5 | Power Output | 35L6GT | 35L6GT | 7AC | |
| 6 | Rectifier | 35W4 | 35W4 | 5BQ | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: GILFILLAN PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 7A | 50 | 150 | 56-21 | AF88D4 | UP4415C | DY-305 | EL352 | ■ Filter |
| B | 40 | 150 | | | | | | ▲ " |
| C | 10 | 25 | | | | | | Cathode Bypass |
| 8A | 50 | 150 | 56-21 | AF88D4 | UP4415C | DY-305 | EL352 | ■ Decoupling |
| B | 40 | 150 | | | | | | ▲ Filter |
| C | 10 | 25 | | | | | | Cathode Bypass |
| 9 | 10 | 25 | | PRS25/10 | BR102A | M-10-25 | TA-25 | Stabilizing Cap. |
| 10 | .05 | 200 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | Line Filter |
| 11 | .25 | 200 | | 484-.25 | DT2P25 | ST-2-25 | 72P3 | Line Isolation |
| 12 | .01 | 200 | | 484-01 | DT2S1 | ST-4-01 | TC-11 | Audio Coupling |
| 13 | .002 | 400 | | 484-002 | DT6D2 | ST-6-002 | TC-22 | AF Plate Bypass |
| 14 | .05 | 200 | | 434-05 | DT2S5 | ST-4-05 | TC-15 | Audio Coupling |
| 15 | .25 | 200 | | 484-.25 | DT2P25 | ST-2-25 | TC-2 | RF Bypass Power Supply |
| 16 | .05 | 200 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 17 | .05 | 200 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | Conv. Screen Bypass |
| 18 | .02 | 200 | | 484-02 | DT2S2 | ST-4-02 | TC-12 | Audio Coupling |
| 19 | 500 | 300 | | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Rectifier Bypass-Cer. |
| 20 | 100 | 300 | | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Line Ant. " |
| 21 | 100 | 300 | | 1469-0001 | 5R5T1 | MOS.5-31 | MS-31 | Diode RF Filter " |
| 22 | 100 | 300 | | 1469-0001 | 5R5T1 | MOS.5-31 | MS-31 | " " " " |
| 23 | 50 | 300 | | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | AM Osc. Grid Cap. " |
| 24 | 100 | 300 | | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Ant. Coupling " |
| 25 | 1000 | 300 | | 1468-001 | 1W5D1 | MW.5-21 | 1FM-21 | De-emphasis " |
| 26 | 500 | 300 | | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | RF Bypass " |
| 27 | 5000 | 300 | DA-048-001A | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Osc. Feedback " |
| 28 | 5000 | 300 | DA-048-001A | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Fil. Bypass " |
| 29 | 20 | 300 | | 1469-000025 | 5R5Q2 | MOS.5-42 | MS-42 | FM Osc. Grid Cap. " |
| 30 | 500 | 500 | | 1469-0005 | 5R5T2 | MOS.5-35 | MS-35 | RF Coupling |
| 31 | 30 | 300 | | 1469-00003 | 5R5Q3 | MOS.5-43 | MS-43 | Regenerative Feedback-Cer. |
| 32 | 30 | 300 | | 1469-00003 | 5R5Q3 | MOS.5-43 | MS-43 | " " " |
| 33 | 2500 | 500 | | 1467-0025 | 1W5D25 | MW.5-225 | 1FM-22 | Quench Net. |
| 34 | 5000 | 300 | DA-048-001A | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | RF Bypass - Cer. |
| 35 | 2 | 300 | | | | | | Osc. Coupling " |
| 36 | 5000 | 300 | DA-048-001A | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | RF Bypass " |

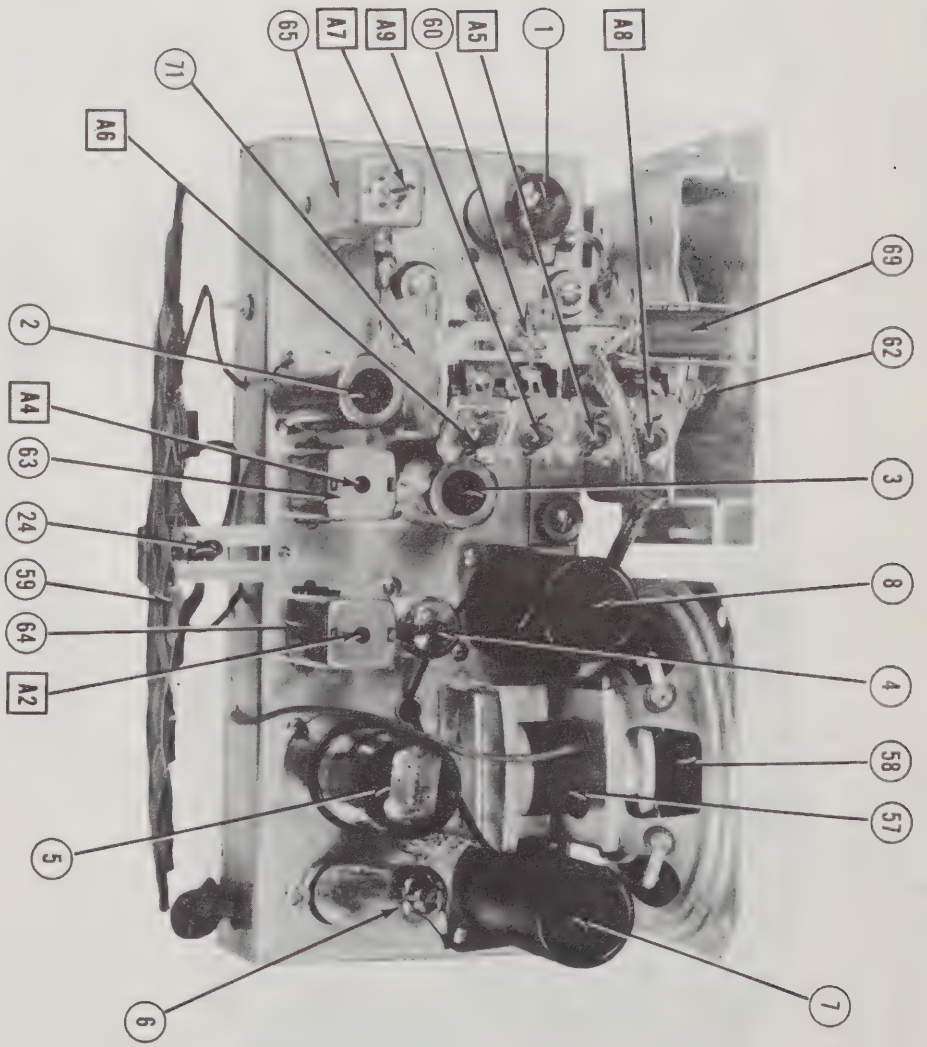
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: GILFILLAN PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 37A | 500KΩ | ½ | 56-108 | D13-133 | M-60-Z | Volume Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 37A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: GILFILLAN PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 38 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. Osc. Grid |
| 39 | 470Ω | ½ | | BTS-470 | Yl.-Vi.-Br. Conv. Decoup. |
| 40 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 41 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Diode Filter |
| 42 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | Yl.-Vi.-Grn. AF Grid |
| 43 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. AF Plate Load |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | GILFILLAN PART No. | IRC PART No. | |
| 44 | 470KΩ | | | BTS-470K | Y1.-V1.-Y1. Output Grid |
| 45 | 220Ω | | | BW-½-220 | Red-Red-Br. Output Cathode |
| 46 | 500Ω | | | AB-500 | Filter |
| 47 | 220KΩ | | | BTS-220K | Red-Red-Y1. Line Isolation |
| 48 | 1500Ω | | | BTS-1500 | Br.-Grn.-Red Quench Network |
| 49 | 22KΩ | | | BTS-22K | Red-Red-Or. Conv. Cathode |
| 50 | 15KΩ | | | BTS-15K | Br.-Grn.-Or. FM IF Transformer Shunt |
| 51 | 150KΩ | | | BTS-150K | Br.-Grn.-Y1. Voltage Dropping |
| 52 | 1000Ω | | | BTS-1000 | Br.-Blk.-Red Decoupling |
| 53 | 100KΩ | | | BTS-100K | Br.-Blk.-Y1. De-emphasis |
| 54 | 100Ω | | | BW-½-100 | Br.-Blk.-Br. FM Osc. Decoup. |
| 55 | 22KΩ | | | BTS-22K | Red-Red-Or. FM Osc. Grid |
| 72 | 22Ω | | | BW-½-22 | Red-Red-Blk. Surge Limiter |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | GILFILLAN PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 56 | 2500Ω | 3.7Ω | 162Ω | .6Ω | 56-16A | A-3876 | T22845 | A-2928 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | GILFILLAN PART No. | JENSEN PART No. | QUAM PART No. | |
| | FIELD | VC IMP. | | ST-113# | | #Drill and tap magnet frame. |
| 57 | PM | 3.7Ω | C14-23036 | Mod. P4-X | 4A15# | |
| | CONE DIA. | VC DIA. | | | | |
| 58 | 4" | 9/16" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | GILFILLAN PART No. | MEISSNER PART No. | |
| 59 | Loop Ant. | | 1Ω | 68F-15-173 | | |
| 60 | FM Ant.Coil | | 0Ω | | | |
| 61 | AM Osc. " | 1Ω | 6Ω | 56-121 | | |
| 62 | FM " " | | 0Ω | | | |
| 63 | Input IF AM | 15Ω | 15Ω | 1655-6 | 16-6678 | |
| 64 | Output IF AM | 19Ω | 19Ω | 1655-7 | 16-6678 | |
| 65A | Output IF FM | | .5Ω | | | |
| B | Conv. Cath. Choke | | 3.0Ω | | | |
| 66 | RF Choke | | 4.0Ω | | | Wound around 10Ω-1W resistor |
| 67 | FM Osc. Cath. Chk. | | .5Ω | | | |
| 68A | Line Choke | | .2Ω | | | |
| B | " " | | .2Ω | | | |

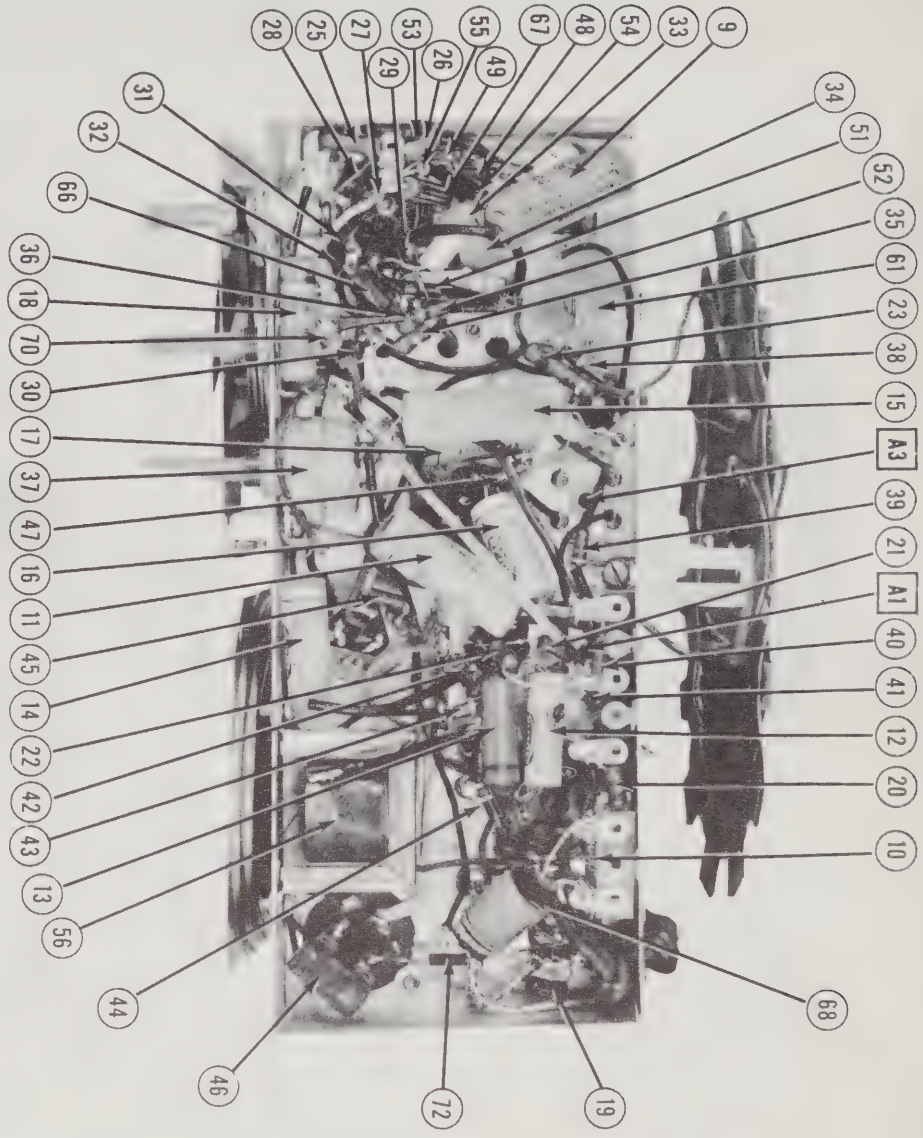
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | GILFILLAN PART No. | | |
| 69 | Bayonet | 6-8 | 0.15 | Brown | TS-47 | | Type 47 |

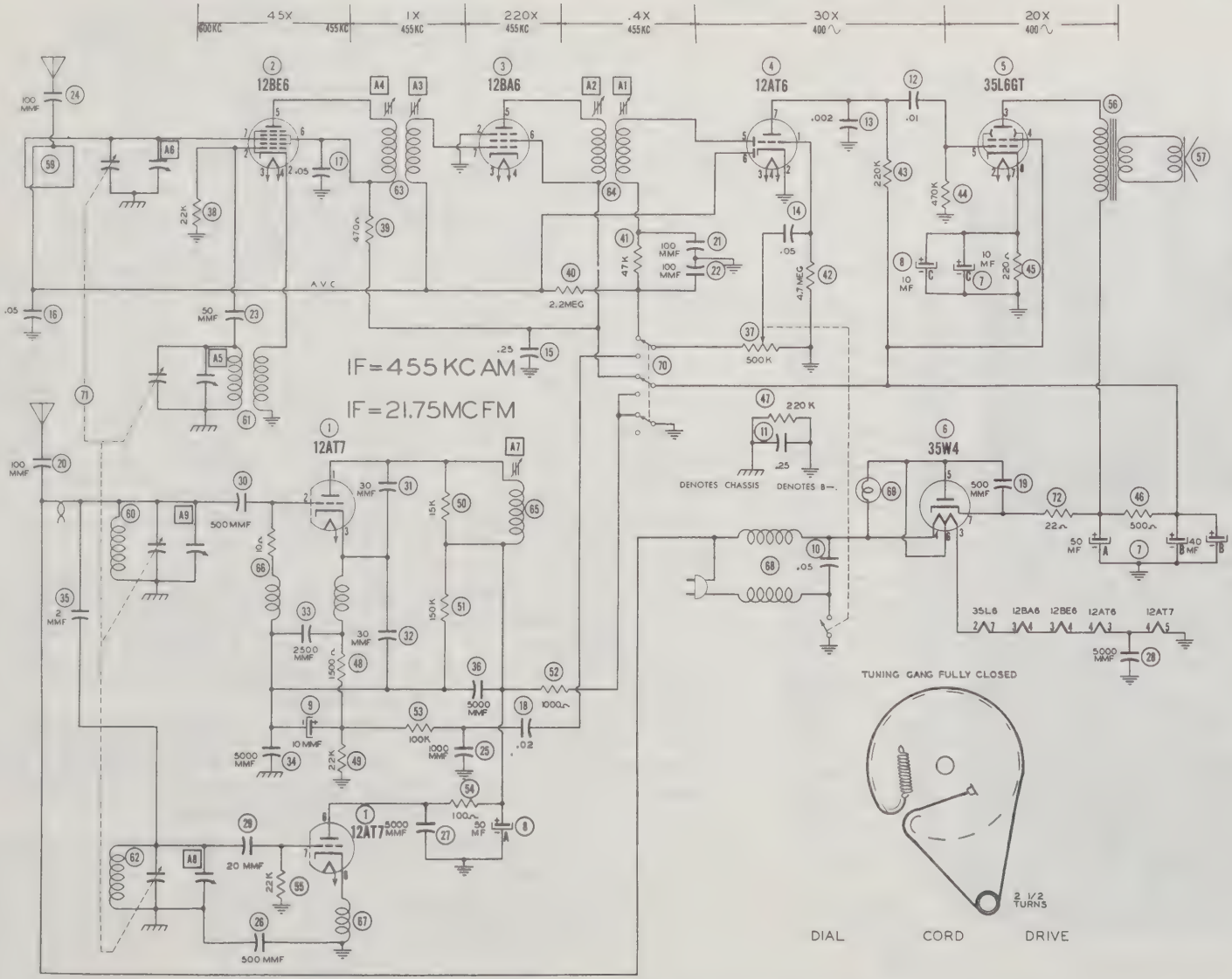
## MISCELLANEOUS

| ITEM No. | PART NAME | GILFILLAN PART No. | NOTES |
|---|---|---|---|
| 70 | Switch | | AM-FM (TPDT) |
| 71 | Tuning Gang | CN-892422 | (38-525MMF, 38-205MMF) |
| | Cabinet | 56B-1B | |
| | Dial Pointer | 56B-8B | |

# CHASSIS—BOTTOM VIEW




DATE 9/48-#4916-11
SET #46-FOLDER #11
GILFILLAN MODEL 68F
GILFILLAN MODEL 68R




VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

| Pin | 12AT7‡ | | [illegible] | |
|---|---|---|---|---|
| No. | Volt | Res | Volt | Res |
| 1 | 11 VAC | 100 MΩ | -6.6VDC§ | 22 MΩ |
| 2 | 2.4VDC | 2.5 MΩ | 0V. | 1 Ω |
| 3 | [illegible] | 2.5 MΩ | 3.3VAC | [illegible] |
| 4 | 12.5VAC | 11Ω | 26VAC | 24Ω |
| 5 | 0V. | 0Ω | 1.3VDC | 1 Ω |
| 6 | 118VAC | 100MΩ | 100VAC | 100MΩ |
| 7 | -1.4VDC§ | 22MΩ | -.4VDC | 2.7 Meg. |
| 8 | 0V. | .2Ω | - | - |
| Cap | [illegible] | 0Ω | - | - |

| Pin | 12[illegible] | | 12A[illegible] | |
|---|---|---|---|---|
| No. | Volt | Res. | Volt. | Res. |
| 1 | -.4VDC | 2.7 Meg. | -.2VDC | 4.8 Meg. |
| 2 | 0V. | 0 | 0V. | 0 |
| 3 | 50VAC | 47Ω | .2VAC | 11Ω |
| 4 | 3.3VAC | 34Ω | 26VAC | 24Ω |
| 5 | 110VDC | 1[illegible] | -.4VDC | 2.7 Meg. |
| 6 | 110VDC | 100KΩ | -.2VDC | 55MΩ |
| 7 | 0V. | 0Ω | 1.3VAC | 320KΩ |
| 8 | - | - | 6.0VDC | - |
| Cap | | - | - | - |

| Pin | 35L6GT | | 35W4 | |
|---|---|---|---|---|
| No. | Volt | Res | Volt | Res. |
| 1 | 0V. | INF. | 0V. | INF. |
| 2 | 65VAC | 0Ω | 0V. | INF. |
| 3 | 118VDC | 100KΩ | 65VAC | 2[illegible] |
| 4 | 118VDC | 100KΩ | 117VAC | 10[illegible] |
| 5 | 0V. | 470KΩ | 114VAC | 10[illegible] |
| 6 | 0V. | 470KΩ | 114VAC | 10MΩ |
| 7 | 50VAC | 48Ω | 120VDC | 100KΩ |
| 8 | 0.0VDC | 220Ω | - | - |
| Cap | - | - | | - |

§TAKEN WITH VACUUM TUBE VOLTMETER.
‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

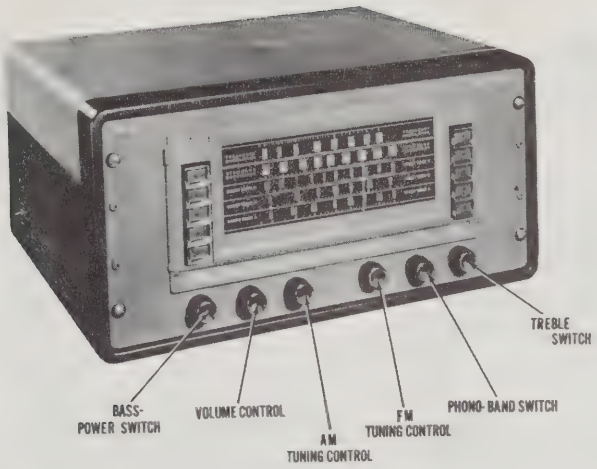
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1948

4816-11

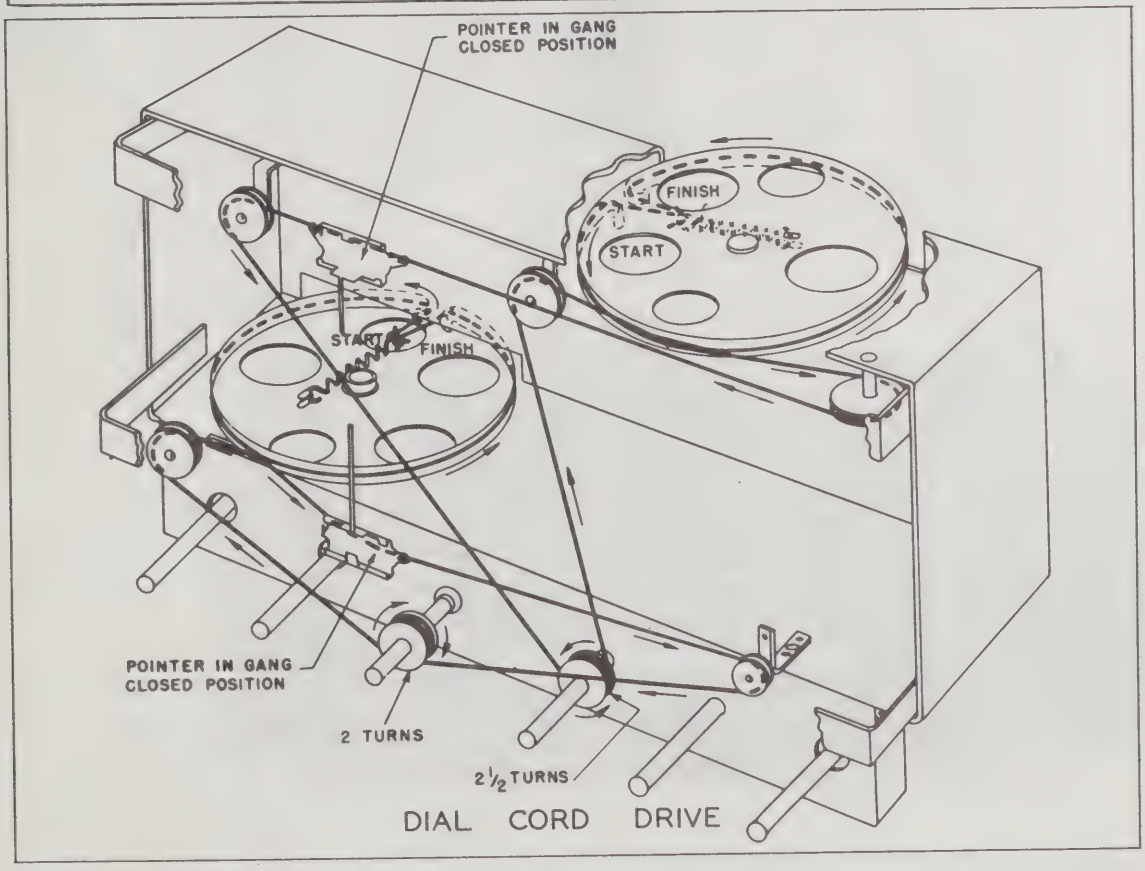
**The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.**

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**




HALLICRAFTERS MODEL S-47

| | |
|---|---|
| TRADE NAME | Hallicrafters, S-47 |
| MANUFACTURER | Hallicrafters Co., 5th & Kostner Avenues, Chicago 24, Ill. |
| TYPE SET | AC Operated Multi-Band AM-FM Superheterodyne Receiver |
| TUBES (FIFTEEN) | Types, 6BA6 RF Amp., 6BE6 Mixer, 6J6 Osc.-AFC, 6SG7 1st IF Amp., 6SG7 2nd IF Amp., 6SG7 FM 3rd IF-AM Det., 6SH7 FM Limiter, 6AL5 FM Det., 6J5 1st AF Amp., 6J5 2nd AF Amp., 6SQ7 3rd AF Amp., 6SQ7 Phase Inv., (2) 6V6GT Power Output, 5U4G Rectifier. |
| POWER SUPPLY | 105-125 Volts AC RATING 1.4 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1700KC SHORT WAVE-Band "A" 15-18MC, Band "B" 9-12MC, Band "C" 5.8-18MC FREQ. MOD. 88-108MC |




DIAL CORD DRIVE

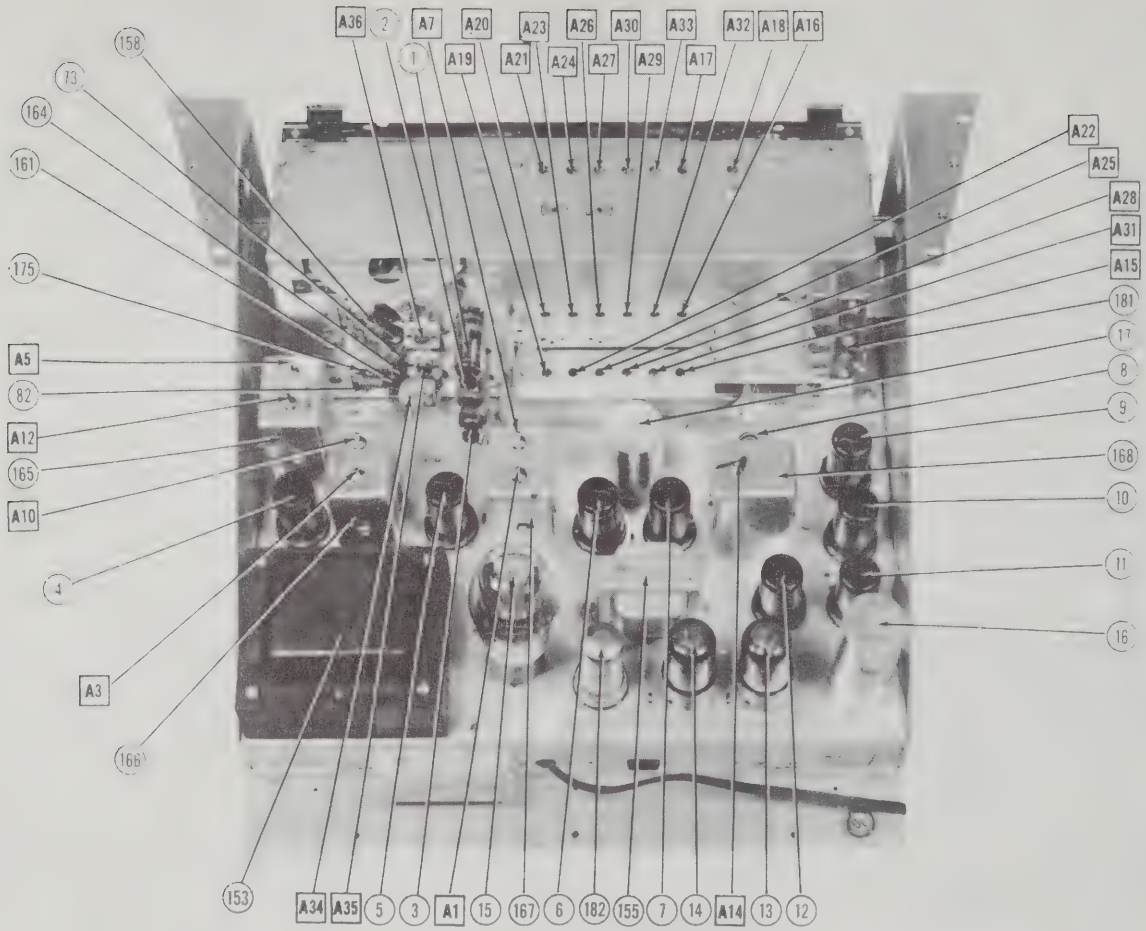
HALLICRAFTERS MODEL
S-47

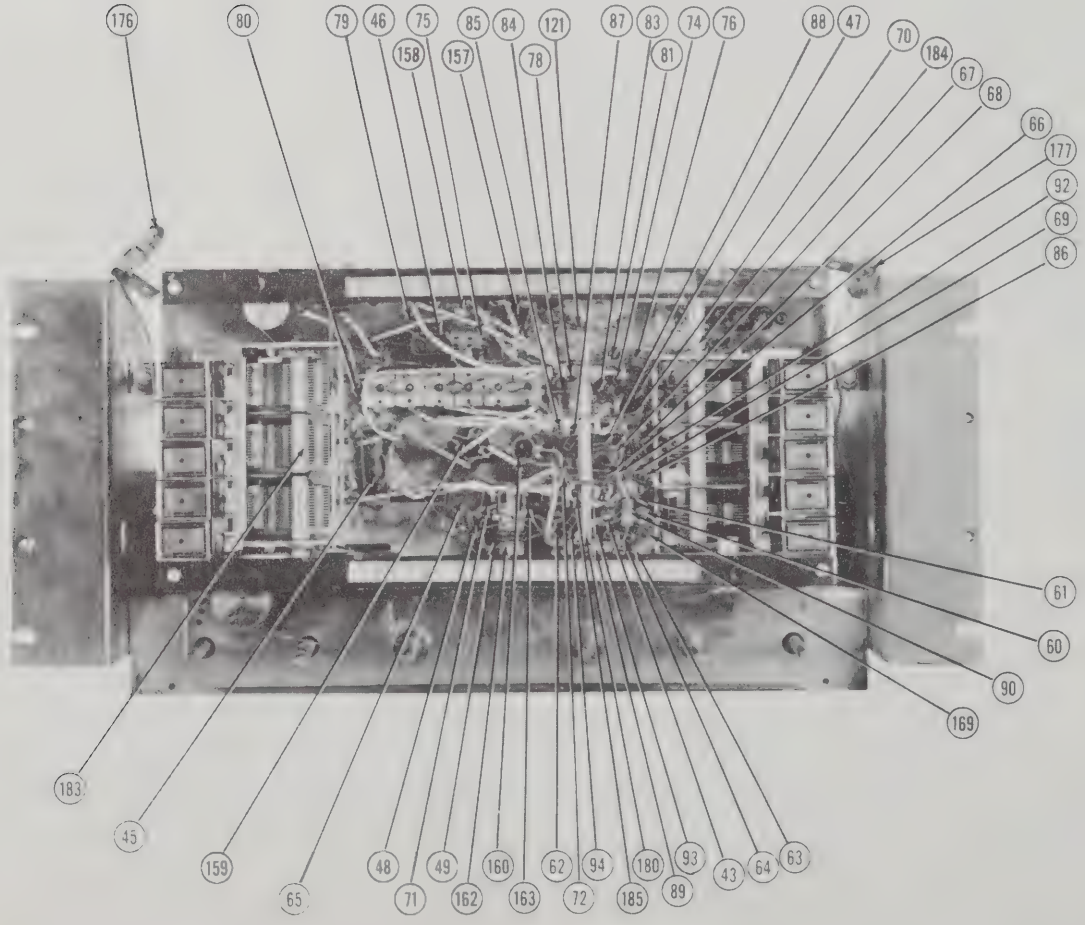
HALLICRAFTERS MODEL
S-47

HOWARD W. SAMS & CO., INC. • • Indianapolis , Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-12 SET #46-FOLDER #12


A36
2
A7
A20
A23
A26
A30
A33
A32
A18
A16
158
1
A19
A21
A24
A27
A29
A17
73
164
161
175
A5
82
A12
165
A10
4
A3
166
153
A34
A35
5
3
A1
15
167
6
182
155
7
14
A14
13
12
A22
A25
A28
A31
A15
181
17
8
9
168
10
11
16


176
80
79
46
75
85
84
121
87
83
74
76
88
47
70
184
67
68
66
177
92
69
86
158
157
78
81
61
60
90
169
183
45
159
65
48
71
49
162
160
163
62
72
94
180
185
93
89
43
64
63

**HALLICRAFTERS MODEL S-47 PAGE 3**

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: HALLICRAFTERS PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6BA6 | 6BA6 | 7BK | |
| 2 | Mixer | 6BE6 | 6BE6 | 7CH | |
| 3 | Osc.-AFC | 6J6 | 6J6 | 7BF | |
| 4 | 1st IF Amp. | 6SG7 | 6SG7 | 8BK | |
| 5 | 2nd IF Amp. | 6SG7 | 6SG7 | 8BK | |
| 6 | FM 3rd IF-AM Det. | 6SG7 | 6SG7 | 8BK | |
| 7 | FM Limiter | 6SH7 | 6SH7 | 8CK | |
| 8 | FM Det. | 6AL5 | 6AL5 | 6BT | |
| 9 | 1st AF Amp. | 6J5 | 6J5 | 6Q | |
| 10 | 2nd AF Amp. | 6J5 | 6J5 | 6Q | |
| 11 | 3rd AF Amp. | 6SL7 | 6SL7 | 8Q | |
| 12 | Phase Inv. | 6SQ7 | 6SQ7 | 8Q | |
| 13 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 14 | " " | 6V6GT | 6V6GT | 7AC | |
| 15 | Rectifier | 5U4G | 5U4G | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: HALLICRAFTERS PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: SOLAR PART No. | REPLACEMENT DATA: SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 16A | 60 | 475 | 45B099 | | UP9DJ53‡ | | | ■ Filter |
| B | 20 | 475 | | | | | | ▲ " |
| C | 20 | 20 | | | | | | Cathode Bypass |
| 17A | 40 | 450 | 45B100 | AF86J4A† | UP9DJ53† | DY-315 | | ■ Filter |
| B | 10 | 450 | | | | | | ▲ Decoupling |
| C | 20 | 30 | | | | | | Cathode Bypass |
| 18 | .01 | 600 | 46AG103J | 684-01 | DT6S1 | MPH-6-01 | TC-11 | Line Filter |
| 19 | .05 | 600 | 46AY503F | 684-05 | DT6S5 | ST-6-05 | TC-15 | Audio Coupling |
| 20 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | " " |
| 21 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | RF Bypass Pwr. Supply |
| 22 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Tone Compensation |
| 23 | .05 | 600 | 46AY503F | 684-05 | DT6S5 | ST-6-05 | TC-15 | Audio Coupling |
| 24 | .1 | 200 | 46AU104H | 484-.1 | DT4P1 | ST-4-.1 | TC-1 | Tone Compensation |
| 25 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Audio Coupling |
| 26 | .003 | 600 | 46AZ302J | 684-003 | DT6D3 | ST-6-003 | TC-23 | " " |
| 27 | .005 | 600 | 46AZ502F | 684-005 | DT6D5 | ST-6-005 | TC-25 | Tone Compensation |
| 28 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | " " |
| 29 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | AVC Filter |
| 30 | .05 | 600 | 46AY503F | 684-05 | DT6S5 | ST-6-05 | TC-15 | Diode Load Cap. |
| 31 | .05 | 600 | 46AY503F | 684-05 | DT6S5 | ST-6-05 | TC-15 | " " " |
| 32 | .05 | 600 | 46AY503F | 684-05 | DT6S5 | ST-6-05 | TC-15 | 4th IF Plate Decoup. |
| 33 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 3rd IF Screen Bypass |
| 34 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 3rd IF Plate Decoup. |
| 35 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 3rd IF Plate Decoup. |
| 36 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 2nd IF Screen Bypass |
| 37 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 2nd IF Cathode Bypass |
| 38 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 2nd IF Plate Decoup. |
| 39 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 2nd IF Grid Filter |
| 40 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 1st IF Plate Decoup. |
| 41 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | 1st IF Screen Bypass |
| 42 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | AVC Filter |
| 43 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Mixer Plate Decoup. |
| 44 | .02 | 600 | 46AY203F | 684-02 | DT6S2 | ST-6-02 | TC-12 | " " " |
| 45 | .05 | 600 | 46AY503F | 684-05 | DT6S5 | ST-6-05 | TC-15 | AVC Filter |
| 46 | .02 | 600 | 46AY203F | 684-02 | DT6S2 | ST-6-02 | TC-12 | " " |
| 47 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Decoupling |
| 48 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Mixer Screen Bypass |
| 49 | .02 | 600 | 46AY203F | 684-02 | DT6S2 | ST-6-02 | TC-12 | AFC Filter |
| 50 | .02 | 600 | 46AY203F | 684-02 | DT6S2 | ST-6-02 | TC-12 | Tone Compensation |
| 51 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Filament Bypass |
| 52 | 220 | 500 | CM20A221M | 1468-0002 | 5W5T2 | MO.5-325 | 1FM-325 | AF Plate Bypass |
| 53 | 330 | 500 | CM20A331M | 1468-00035 | 5W5T3 | MO.5-33 | 1FM-33 | Tone Compensation |
| 54 | 22 | 500 | CM20A220K | 1468-000025 | 5W5Q2 | MO.5-425 | MS-42 | " " |
| 55 | 100 | 500 | CM20A101M | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | RF Bypass |
| 56 | 1000 | 300 | CM30A102M | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | De-emphasis |
| 57 | 47 | 500 | CM20A470M | 1468-00005 | 5W5.5 | MO.5-45 | 1FM-45 | IF Coupling |
| 58 | 220 | 500 | CM20A221M | 1468-0002 | 5W5T2 | MO.5-325 | 1FM-325 | Diode RF Filter |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: HALLICRAFTERS PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 110 | 10KΩ | 2 | RC40AE103M | BT-2-10K | Br.-Blk.-Or. Voltage Dropping |
| 111 | 10KΩ | 2 | RC40AE103M | BT-2-10K | Br.-Blk.-Or. " " |
| 112 | 150Ω | ½ | RC20AE151M | | Br.-Grn.-Br. Osc. Cathode |
| 113 | 220Ω | ½ | RC20AE221M | | Red-Red-Br. 3rd IF Cathode |
| 114 | 47KΩ | 1 | RC30AE473M | BTA-47K | Yl.-Vi.-Or. 3rd IF Screen Dropping |
| 115 | 3300Ω | ½ | RC20AE333M | BTS-3300 | Or.-Or.-Red 3rd IF Plate Load |
| 116 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. 4th IF Grid |
| 117 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. 4th IF Screen Dropping |
| 118 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. Ratio Det. Diode Load |
| 119 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. " " " " |
| 120 | 10KΩ | ½ | RC20AE103M | BTS-10K | Br.-Blk.-Or. De-emphasis |
| 121 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. | Br.-Blk.-Grn. AFC Network |
| 122 | 33Ω | ½ | RC20AE330M | BW-½-33 | Or.-Or.-Blk. Feedback |
| 123 | 1000Ω | ½ | RC20AE102M | BTS-1000 | Br.-Blk.-Red " |
| 124 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. Tone Comp. |
| 125 | 220KΩ | ½ | RC20AE224M | BTS-220K | Red-Red-Yl. 2nd AF Grid |
| 126 | 4700Ω | ½ | RC20AE472M | BTS-4700 | Yl.-Vi.-Red Tone Comp. |
| 127 | 33KΩ | ½ | RC20AE333M | BTS-33K | Or.-Or.-Or. 1st AF Plate Load |
| 128 | 3300Ω | ½ | RC20AE3324 | BTS-3300 | Or.-Or.-Red 2nd AF Plate Load |
| 129 | 33KΩ | ½ | RC20AE333M | BTS-33K | Or.-Or.-Or. Tone Comp. |
| 130 | 390KΩ | ½ | RC20AE394K | BTS-390K | Or.-Wh.-Yl. 3rd AF Grid |
| 131 | 22KΩ | ½ | RC20AE223M | BTS-22K | Red-Red-Or. Tone Comp. |
| 132 | 47KΩ | ½ | RC20AE473M | BTS-47K | Yl.-Vi.-Or. " " |
| 133 | 220Ω | ½ | RC20AE221M | BW-½-220 | Red-Red-Br. Cathode Bias Network |
| 134 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Grn. 3rd AF Grid |
| 135 | 100Ω | ½ | RC20AE101K | BW-½-100 | Br.-Blk.-Br. Feedback |
| 136 | 470Ω | ½ | RC20AE471M | BTS-470 | Yl.-Vi.-Br. Cathode Bias Network |
| 137 | 470KΩ | ½ | RC20AE474M | BTS-470K | Yl.-Vi.-Yl. 3rd AF Plate Load |
| 138 | 3900Ω | ½ | RC20AE392K | BTS-3900 | Or.-Wh.-Red Phase Inverter Cathode |
| 139 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. Phase Inverter Grid |
| 140 | 220KΩ | ½ | RC20AE224M | BTS-220K | Red-Red-Yl. Phase Inverter Plate Load |
| 141 | 330KΩ | ½ | RC20AE334M | BTS-330K | Or.-Or.-Yl. Output Grid |
| 142 | 470KΩ | ½ | RC20AE474M | BTS-470K | Yl.-Vi.-Yl. " " |
| 143 | 330Ω | 5 | 24A864 | AB-300 | Or.-Or.-Br. Output Cathode |
| 144 | 470Ω | 2 | RC40AE471M | BT-2-470 | Yl.-Vi.-Br. Tone Compensation |
| 145 | 330Ω | 5 | 24A864 | AB-300 | Or.-Or.-Br. Filter |
| 146 | 12KΩ | ½ | RC20AE123K | BTS-12K | Br.-Red-Or. Feedback |
| 147 | 50Ω | 4 | RC65CB470M | AB-50 | Grn.-Blk.-Blk. Voltage Dropping |
| 148 | 22KΩ | 1 | RC30AE223M | BTA-22K | Red-Red-Or. Decoupling |
| 149 | 820KΩ | ½ | RC20AE821K | BTS-820K | Gray-Red-Yl. Tone Comp. |
| 150 | 68KΩ | ½ | RC20AE683K | BTS-68K | Blue-Gray-Or. Bleeder |
| 151 | 10KΩ | ½ | RC20AE103M | BTS-10K | Br.-Blk.-Or. Tone Comp. |
| 152 | 330KΩ | ½ | RC20AE334M | BTS-330K | Or.-Or.-Yl. Phono Shunt |

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: HALLICRAFTERS PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDARSON PART No. | REPLACEMENT DATA: MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 153 | 117V AC @ 1.4A | 780V CT .175A DC | 5.2V AC @ 3.0A | 6.4V AC @ 3.0A | 52C151 | P-6135 | T22R07 | P-2955 |

## TONE CHOKE

| ITEM NO. | RATINGS: TOTAL DIRECT CURRENT | RATINGS: D.C. RESISTANCE | RATINGS: INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA: HALLICRAFT. PART NO. | REPLACEMENT DATA: STANCOR PART NO. | REPLACEMENT DATA: THORDARSON PART NO. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 154 | 4.5MA | 650Ω | 12.5 Henries | 56B082 | | | | |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: HALLICRAFT. PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDAR'N PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 155 | 7000Ω CT | 500Ω CT | 400Ω | 31Ω | 55M096 | | T-22S68* | | *Drill new mounting holes. |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA HALLICRAFTERS PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 59 | 220 | 500 | CM20A221M | 1468-0002 | 5W5T2 | MO.5-325 | 1FM-325 | " " " |
| 60 | 10 | 500 | 47A149 | 1468-00001 | 5W5Q1 | MO.5-41 | MS-41 | RF Coupling-Cer. |
| 61 | 10000 | 300 | 47B32103N1 | 1467-01 | 1D3S1 | MW.3-11 | 1FM-11 | Osc. Cathode Bypass-Cer. |
| 62 | 47 | 500 | CM20A470M | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | AFC Filter |
| 63 | 500 | 300 | 47A147 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Osc. Feedback-Cer. |
| 64 | 1000 | 300 | 47A148 | 1468-001 | 1W5D1 | MO.3-21 | 1FM-21 | Osc. Decoupling-Cer. |
| 65 | 3900 | 300 | CM35A392J | | | | | Fixed Pad |
| 66 | 47 | 500 | 47A150 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap.-Cer. |
| 67 | 10 | 500 | CM20A100K | 1468-00001 | 5W5Q1 | MO.5-41 | MS-41 | Mixer Plate Bypass |
| 68 | 1000 | 300 | 47A148 | 1468-001 | 1W5D1 | MW.5-21 | 1FM-21 | Mixer Screen Bypass-Cer. |
| 69 | 47 | 500 | 47A150 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Coupling-Cer. |
| 70 | 500 | 300 | 47A147 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | RF Plate Decoup.-Cer. |
| 71 | 39 | 500 | CC30SH390M | | | | | Fixed Pad-Cer. |
| 72 | 1.5 | 500 | 47A160-3 | | | | | Osc. Feedback-Cer. |
| 73 | 22 | 500 | CM20A220K | | | | | Fixed Trimmer-Silver |
| 74 | 1000 | 300 | 47A148 | 1468-001 | 1W5D1 | MW.5-21 | 1FM-21 | RF Screen Bypass-Cer. |
| 75 | 100 | 500 | CM20A101M | 1468-0001 | 5W5T1 | MO5.5-31 | 1FM-31 | Fixed Trimmer |
| 76 | 47 | 500 | CM20A470M | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Coupling |
| 185 | 1000 | 300 | 47A148 | 1468-001 | 1W5D1 | MW.5-21 | 1FM-21 | Fil. Bypass-Cer. |
| 186 | .01 | 600 | 46AG103F | 684-01 | DT6S1 | ST-6-01 | TC-11 | Fil. Bypass |

†Omit one section.
‡Parallel sections to obtain desired capacity.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA HALLICRAFTERS PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 77A | 2 Meg. | ½ | 25A685 | D13-139 | M-66-Z | Volume Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 77A per instructions |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA HALLICRAFTER PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 78 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. | Br.-Blk.-Grn. RF Grid |
| 79 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 80 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. " " |
| 81 | 100Ω | ½ | RC20AE333M | | Br.-Blk.-Grn. RF Cathode |
| 82 | 10Ω | ½ | RC20AE100M | | Br.-Blk.-Blk. Parasitic Suppressor |
| 83 | 33KΩ | 1 | RC30AE333M | BTA-33K | Or.-Or.-Or. RF Screen Dropping |
| 84 | 1000Ω | ½ | RC20AE102M | BTS-1000 | Br.-Blk.-Red Decoupling |
| 85 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. | Br.-Blk.-Grn. Conv. Grid |
| 86 | 22KΩ | ½ | RC20AE223M | BTS-22K | Red-Red-Or. Mixer Injector Grid |
| 87 | 10Ω | ½ | RC20AE100M | | Br.-Blk.-Blk. Parasitic Suppressor |
| 88 | 33KΩ | 2 | RC40AE333K | BT-2-33K | Or.-Or.-Or. Converter Screen Dropping |
| 89 | 1000Ω | ½ | RC20AE102M | BTS-1000 | Br.-Blk.-Red Converter Plate Decoupling |
| 90 | 1000Ω | ½ | RC20AE102M | BTS-1000 | Br.-Blk.-Red Decoupling |
| 91 | 220Ω | ½ | RC20AE221M | | Red-Red-Br. Parasitic Suppressor |
| 92 | 22KΩ | ½ | RC20AE223M | BTS-22K | Red-Red-Or. Osc. Grid |
| 93 | 220Ω | ½ | RC20AE221M | | Red-Red-Br. AFC Network |
| 94 | 100KΩ | ½ | RC20AE104M | BTS-100K | Br.-Blk.-Yl. " " |
| 95 | 10KΩ | 2 | RC40AE103M | BTS-10K | Br.-Blk.-Or. Voltage Dropping |
| 96 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. | Br.-Blk.-Grn. Tone Comp. |
| 97 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. | Br.-Blk.-Grn. " " |
| 98 | 47KΩ | ½ | RC20AE473M | BTS-47K | Yl.-Vi.-Or. " " |
| 99 | 68KΩ | ½ | RC20AE683K | BTS-68K | Blue-Gray-Or. AVC Network |
| 100 | 47KΩ | 1 | RC30AE473M | BTA-47K | Yl.-Vi.-Or. 1st IF Screen Dropping |
| 101 | 1000Ω | ½ | RC20AE102M | BTS-1000 | Br.-Blk.-Red 1st IF Plate Decoup. |
| 102 | 330KΩ | ½ | RC20AE334M | BTS-330K | Or.-Or.-Yl. Diode Load |
| 103 | 220KΩ | ½ | RC20AE224M | BTS-220K | Red-Red-Yl. 2nd IF Grid |
| 104 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 105 | 220Ω | ½ | RC20AE221M | | Red-Red-Br. 2nd IF Cathode |
| 106 | 7000Ω | 1 | RC30AE472M | BTA-7K | Vi.-Blk.-Red 2nd IF Screen Dropping |
| 107 | 1000Ω | ½ | RC20AE102M | BTS-1000 | Br.-Blk.-Red 2nd IF Plate Decoupling |
| 108 | 220KΩ | ½ | RC20AE224M | BTS-220K | Red-Red-Yl. Diode Load |
| 109 | 47KΩ | ½ | RC20AE473M | BTS-47K | Yl.-Vi.-Or. Diode RF Filter |

DATE 9/48-#4916-12 SET #46-FOLDER #12

# PARTS LIST AND DESCRIPTIONS (Continued)

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA HALLICRAFTER PART No. | REPLACEMENT DATA MEISSNER PART No. |
|---|---|---|---|---|---|
| 156 | Ant. Coil BC | 42Ω | 7.4Ω | 51B955 | |
| 157 | " " SW | 0Ω | .3Ω | 51B909 | |
| 158 | " " FM | | 0Ω | 51B916 | |
| 159 | RF Coil BC | 6.7Ω | 20.7Ω | 51B910 | |
| 160 | " " SW | 0Ω | 5.8Ω | 51B905 | |
| 161 | " " FM | 0Ω | 0Ω | 51B915 | |
| 162 | Osc.Coil BC | | 4.8Ω | 51B911 | |
| 163 | " " SW | | .3Ω | 51B908 | |
| 164 | " " FM | | 0Ω | 51B914 | |
| 165 | 1st IF Trans. | 5Ω | 5Ω | 50C210 | |
| 166 | 2nd IF " | 5.5Ω | 5.3Ω | 50C200 | |
| 167 | 3rd IF " | 5.8Ω | 5.3Ω | 50C209 | |
| 168 | FM Det. " | 2Ω | 1.2Ω | 50C206 | |
| 169 | RF Choke | | .2Ω | 53B008 | |
| 170 | " " | | .2Ω | 53B009 | |
| 171 | " " | | 10.5Ω | 53A106 | |
| 172 | " " | | 10.5Ω | 53A106 | |
| 173 | " " | | 10.5Ω | 53A106 | |
| 174 | " " | | 10.5Ω | 53A106 | |
| 175 | " " | | 0Ω | 53A115 | |

## DIAL LIGHT

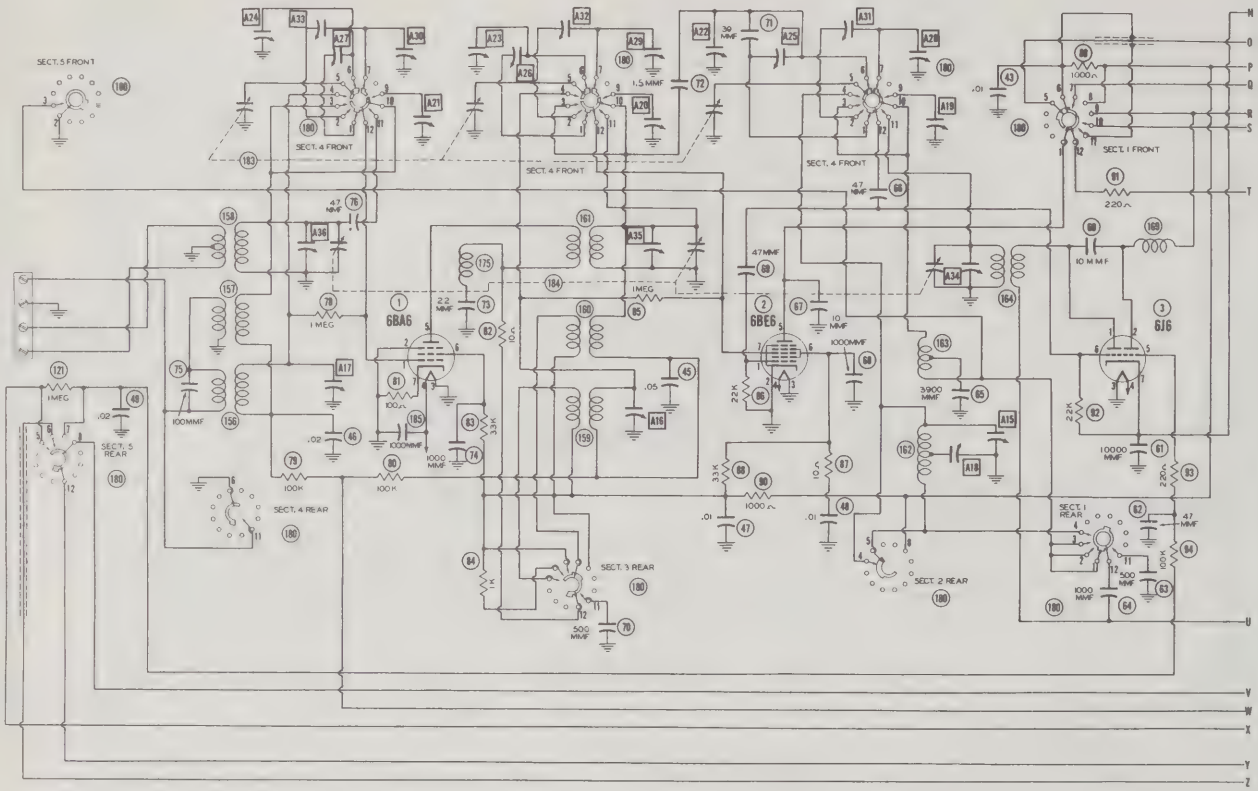
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA HALLICRAFTERS PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 176 | Bayonet | 6-8 | 0.15 | Brown | | Type 47 |
| 177 | " | " | " | " | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | HALLICRAFTERS PART No. | NOTES |
|---|---|---|---|
| 178 | Switch | 60B307 | Bass-On-Off |
| 179 | " | 60B264 | Treble |
| 180 | " | 60C266 | Band |
| 181 | " | 18A092 | Muting |
| 182 | Ballast Tube | 24B870 | |
| 183 | 3 Gang Var. Cap | 48C176 | (AM) (12-475MMF) each section |
| 184 | " " " " | 48C175 | (FM) |
| A18 | Trimmer | 44A189 | BC Osc. Adj. |
| | Trimmer Strip (Osc) | 44B195 | A15, A19, A22, A25, A28, A31 |
| | " " (RF) | 44B196 | A16, A20, A23, A26, A29, A32 |
| | " " (Ant) | 44B190 | A17, A21, A24, A27, A30, A33 |
| A35 | Trimmer | 44A192 | FM RF Adj. |
| A36 | " | 44A194 | FM Ant. Adj. |
| | Pointer | 82B143 | AM |
| | " | 82B138 | FM |
| | Dial Glass | 22B184 | Upper |
| | " " | 22B183 | Lower |
| | Knob | 15A131 | |

PUSHBUTTON ADJUSTMENTS

1. Make up list of stations desired to be set up.
2. Turn set on and allow to warm up for at least fifteen minutes.
3. Insulate muting switches by inserting paper strip between contacts.
4. Remove transparent section of button and insert screwdriver thru large hole of button.
5. Loosen locking screw not more than one turn.
6. Depress pushbutton and manually tune in station desired to be set up, and tighten locking screw.
7. Insert call letter tab of station between transparent section of button and metal insert and replace insert in button. This station is now set up.
8. Repeat the above procedure for the remaining buttons to be set up.




VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION

NOTE—Tone Control full clockwise.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BA6 | -.1VDC | 0V. | 0V. | .47VDC | 260VDC | 6.4VAC | 1.1VDC | - |
| 2 | 6BE6 | .....VDC | 0V. | 0V. | .....VDC | 320VDC | .....VDC | -.2VDC | - |
| 3 | 6J6 | 2.1VDC | 1.7VDC | 0V. | 6.4VAC | 0V. | -14VDC | 2VDC | - |
| 4 | 6AV6 | 1.1VDC | 1.1V. | 0V. | .....VDC | -.....VDC | -3.3VDC | 4VDC | - |
| 5 | 6BA7 | 0V. | 0V. | 0V. | .....VDC | 0V. | 136VDC | 6.4VAC | 310VDC |
| 6 | 6BE7 | 0V. | 0V. | 0V. | .....VDC | 0V. | 162VDC | 6.4VAC | 315VDC |
| 6a | 6BA7 | 0V. | 0V. | 0V. | .....VDC | 0V. | 1.3VDC | 6.4VAC | 1.5VDC |
| 6b | 6BE7 | 0V. | 0V. | 0V. | .....VDC | 0V. | 140VDC | 6.4VAC | 245VDC |
| 7 | 6AV6 | 0V. | 0V. | 0V. | .....VDC | 0V. | 75VDC | 6.3VAC | 77VDC |
| 8 | 6A12 | .....VDC | 9VDC | 6.3VAC | 0V. | 5VDC | 0V. | -3.6VDC | - |
| 9 | 6J5 | 0V. | 6.4VAC | 70VDC | .47VDC | 0V. | 125VDC | 0V. | 3VDC |
| 10 | 6J6 | 0V. | 6.4VAC | 112VDC | 130VDC | 0V. | 0V. | 0V. | 6VDC |
| 11 | 6BQ7 | 0V. | 0V. | 1VDC | 0V. | 0V. | 125VDC | 6.4VAC | 0V. |
| 12 | 6BQ7 | 0V. | -.1VDC | 2VDC | 0V. | 0V. | 200VDC | 6.4VAC | 0V. |
| 13 | 6V6GT | 0V. | 0V. | 345VDC | 325VDC | 0V. | 0V. | 6.4VAC | 21VDC |
| 14 | 6V6GT | 0V. | 0V. | 345VDC | 325VDC | 0V. | 0V. | 6.4VAC | 21VDC |
| 15 | 6U4G | 400VDC | 0V. | 390VAC | 0V. | 390VAC | 0V. | 400VDC | |

‡TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BA6 | 1.1 Meg. | 0Ω | 0Ω | .6Ω | 400Ω | 74KΩ | 110Ω | - |
| 2 | 6BE6 | 1.1 Meg. | 0Ω | 0Ω | .6Ω | 400Ω | 74KΩ | 1.1 Meg. | - |
| 3 | 6J6 | 0Ω | 100Ω | 0Ω | 0Ω | INF. | 22KΩ | 1KΩ | - |
| 4 | 6AV6 | 0Ω | 100Ω | 0Ω | .03Ω | INF. | 22KΩ | 1KΩ | - |
| 5 | 6BA7 | 0Ω | 0Ω | 0Ω | 1.4 Meg. | 0Ω | 77KΩ | 0Ω | 440Ω |
| 6 | 6BE7 | 0Ω | 0Ω | 0Ω | 2.4MΩ | 0Ω | 77KΩ | 0Ω | 440Ω |
| 6a | 6BA7 | 0Ω | 0Ω | 0Ω | 600KΩ | 0Ω | 77KΩ | 0Ω | 250Ω |
| 6b | 6BE7 | 0Ω | 0Ω | 0Ω | 600KΩ | 0Ω | 77KΩ | 0Ω | 1.1KΩ |
| 7 | 6AV6 | 0Ω | 0Ω | 0Ω | 110KΩ | 0Ω | 140KΩ | 0Ω | 14KΩ |
| 8 | 6A12 | INF. | 5M. | 0Ω | 0Ω | 0Ω | 140KΩ | 0Ω | 14KΩ |
| 9 | 6J5 | 0Ω | .03Ω | .07KΩ | 40KΩ | 2 Meg. | 80KΩ | 0Ω | 680Ω |
| 10 | 6J6 | 0Ω | .03Ω | .07KΩ | 40KΩ | .2KΩ | INF. | 0Ω | 680Ω |
| 11 | 6BQ7 | 0Ω | 100KΩ | 220Ω | 0Ω | 0Ω | 510KΩ | .05Ω | 0Ω |
| 12 | 6BQ7 | 0Ω | 100KΩ | 3.9KΩ | 0Ω | 0Ω | 280KΩ | .05Ω | 0Ω |
| 13 | 6V6GT | 0Ω | 0Ω | 40KΩ | 40KΩ | 430KΩ | 100KΩ | .05Ω | 520Ω |
| 14 | 6V6GT | 0Ω | 0Ω | 40KΩ | 40KΩ | 570KΩ | INF. | .05Ω | 520Ω |
| 15 | 6U4G | INF. | 40KΩ** | INF. | 100Ω | INF. | .05Ω | INF. | 40KΩ** |

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

Voltage and Resistance Readings taken with 500Ω load.

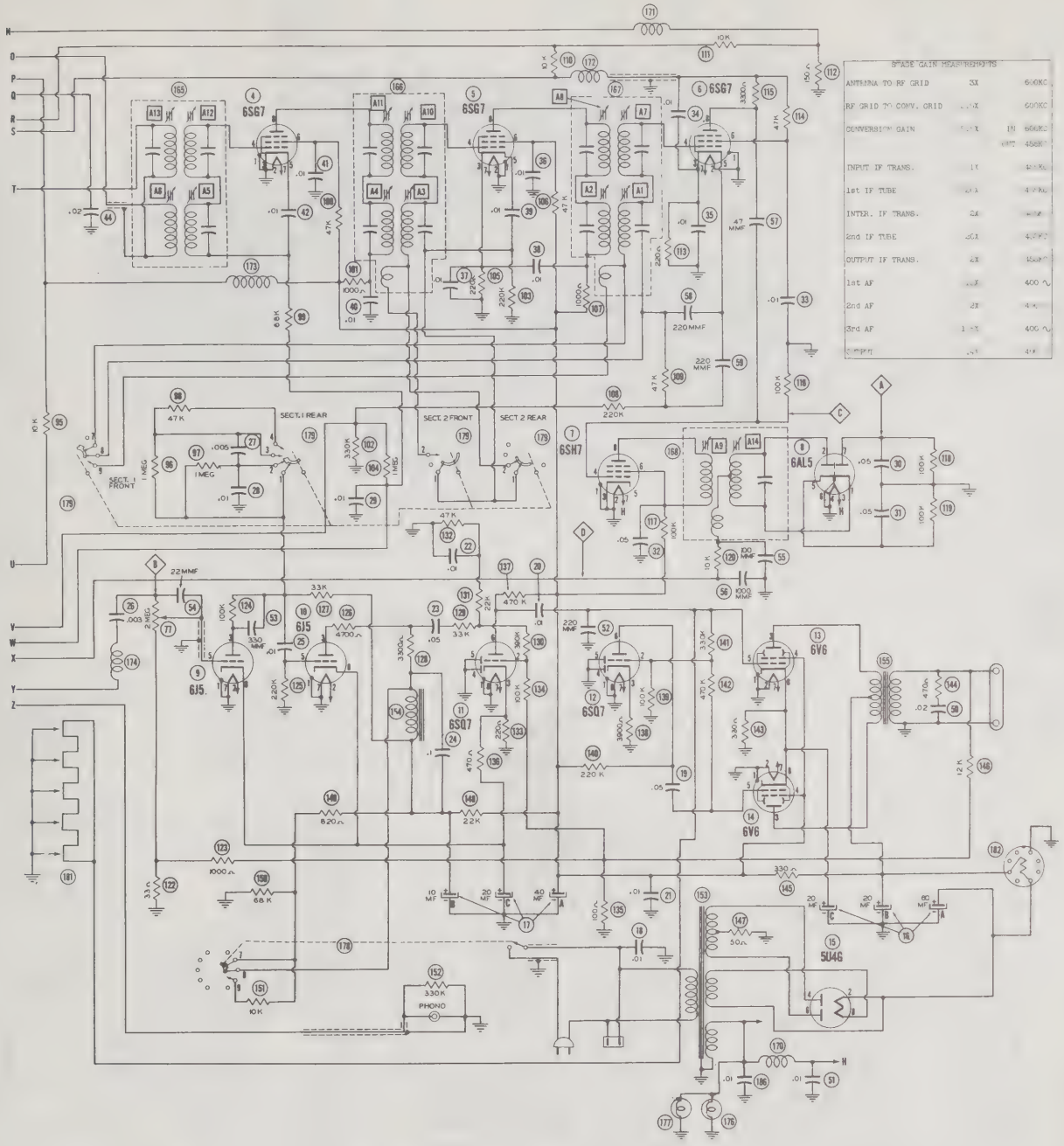
**18KΩ in FM position.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1948




IF=455KC AM

IF=10.7MC FM

**The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1948

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use scales on dial pointer rails for calibration purposes. These are accessible after dial backplate has been removed. With tuning caps. fully closed set right edges of dial pointer saddles to "0" on both scales.

Use insulated screwdriver for all adjustments.

Set treble tone control to #1 position fully counter-clockwise.

### AM IF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .01 MFD | High side to stator of center section of AM tuning cap. Low side of chassis. | 455KC | BC (3 Positions from full counter-clockwise) | #55 on AM calibration strip. | Across voice coil | A1, A2, A3, A4, A5, A6. | Adjust for maximum output with tone control fully counter-clockwise. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a VTVM is not available a 20KΩ per volt DC voltmeter may be used.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2 | .01 MFD | High side to stator of center section of FM tuning cap. Low side to chassis. | 10.7MC (Unmodulated) | FM (4 Positions from full counter-clockwise) | #50 on FM calibration strip. | DC probe to Point ⏚ .Common to chassis | A7, A8, A9, A10, A11, A12 A13 | Adjust for maximum deflection. |
| 3 | .01 MFD | " | " | " | " | DC probe to Point ⏚ .Common to chassis | A14 | Adjust for zero deflection. Continue with RF Alignment in Step 5. |

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 250KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2 | .01 MFD | High side to Pin 4 (grid) of 6SG7 1st IF Tube (4). Low side to chassis. | 10.7MC (Freq. Mod.) | FM (4 Positions from full counter-clockwise) | #50 on FM calibration strip. | Vertical input in series with 200K Ω resistor to Point ⏚ .Ground to chassis | A7, A8, A10, A11 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 3 | .01 MFD | High side to stator of center section of FM tuning cap. Low side to chassis. | " | " | " | " | A12, A13 | " |
| 4 | .01 MFD | High side to Pin 4 (grid) of 6SG7 1st IF Tube (4). Low side to chassis. | " | " | " | Vertical input to Point ⏚. Ground to chassis. | A9, A14 | Alternately adjust A9 for maximum amplitude and A14 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Continue with RF Alignment in Step 5. |

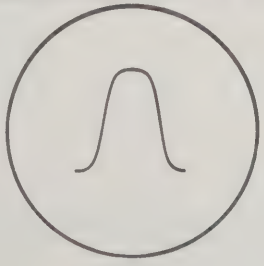


FIG. 1

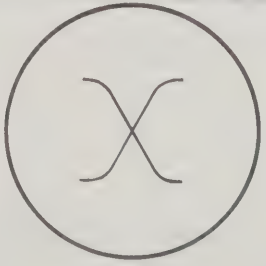


FIG. 2

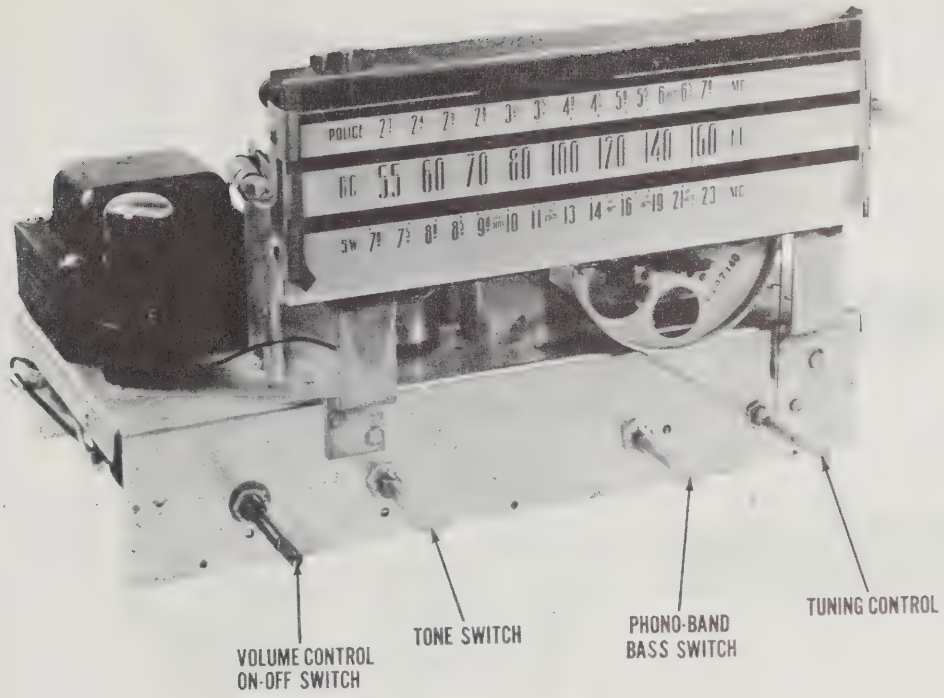
### RF ALIGNMENT

Standard RMA dummy antenna consists of 200 MMFD cap. in series with a 20 microhenry RF Choke with choke shunted by a 400 MMFD cap. in series with a 400Ω carbon resistor.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5 | RMA Dummy | To terminals "A" and "B" on ant. terminal strip | 1500KC | BC | #82 on AM calibration strip. | Across voice coil | A15 | Adjust for maximum output |
| 6 | " | " | " | " | Tune for maximum output. | " | A16, A17 | Adjust for maximum output |
| 7 | " | " | 600KC | " | #15.5 on AM calibration strip. | " | A18 | Adjust for maximum output. Repeat Steps 5, 6 & 7 until no further improvement can be made. |
| 8 | " | " | 16MC | Band "C" (2 positions from full counter-clockwise) | #84 on AM calibration strip. | " | A19 | Adjust for maximum output. |
| 9 | " | " | " | " | Tune for maximum output. | " | A20, A21 | Rock tuning cap. and adjust for maximum output. |
| 10 | " | " | 18MC | "A" (fully counter-clockwise) | #64.5 on AM calibration strip. | " | A22 | Adjust for maximum output |
| 11 | " | " | " | " | Tune for maximum output. | " | A23, A24 | Rock tuning cap. and adjust for maximum output. |
| 12 | " | " | 15MC | " | #7.5 on AM calibration strip. | " | A25 | Adjust for maximum output. |
| 13 | " | " | " | " | Tune for maximum output. | " | A26, A27 | Rock tuning cap. and adjust for maximum output. Repeat Steps 10, 11, 12 & 13 until no further improvement can be made. |
| 14 | " | " | 12MC | "B" (1 Position from full counter-clockwise) | #61.5 on AM calibration strip. | " | A28 | Adjust for maximum output |
| 15 | " | " | " | " | Tune for maximum output. | " | A29, A30 | Rock tuning cap. and adjust for maximum output. |
| 16 | " | " | 9MC | " | #6.5 on AM calibration strip. | " | A31 | Adjust for maximum output |
| 17 | " | " | " | " | Tune for maximum output. | " | A32, A33 | Rock tuning cap. and adjust for maximum output. Repeat Steps 14, 15, 16 & 17 until no further improvement can be made. |
| 18 | 2 - 150Ω carbon res. | Each side in series with 150Ω to FM dipole terminals. | 108MC | FM | #83.5 on FM calibration strip. | " | A34 | Adjust for maximum output |
| 19 | " | " | " | " | Tune for maximum output. | " | A35, A36 | " " " " |

KNIGHT MODEL
8D-340




KNIGHT MODEL 8D-340

| | |
|---|---|
| TRADE NAME | Knight, Model 8D-340 |
| SUPPLIER | Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill. |
| TYPE SET | AC Operated Multi-Band Superheterodyne Receiver with Loop Antenna |
| TUBES (EIGHT) | Types, 6SK7GT RF Amp., 6SA7 Converter, 6SK7 IF Amp., 6SQ7 Det.-AVC-AF, 6J5 Phase Inverter, (2) 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 110-120 Volts AC — RATING .780 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 535-1680KC — SHORT WAVE 2.2-7.2MC 6.9-23.5MC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to the + mark at low freq. end of BC band.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .01 MFD. | High side to center stator of tuning cap. Low side to chassis. | 455KC | BC | High freq. end of dial | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output |
| 2 | 100MMFD | High side to ant. terminal. Low side to chassis. | 1680KC | " | Tuning cap. fully open. | " | A5 | " " " " |
| 3 | 100MMFD | " | 1500KC | " | Tune for maximum output. | " | A6,A7 | " " " " |
| 4 | 100MMFD | " | 600KC | " | " | " | A8 | Rock tuning cap. and adjust for maximum output. |
| 5 | 100MMFD | " | 1680KC | " | Tuning cap. fully open. | " | A5 | Adjust for maximum output |
| 6 | .01 MFD | High side to Pin 8 (grid) 6SA7. Low side to chassis. | 7.2MC | SW 1 | " | " | A9 | " " " " |
| 7 | 400Ω | High side to ant. terminal. Low side to chassis. | 2.5MC | " | 2.5MC | " | A10 | Rock tuning cap. and adjust for maximum output. |
| 8 | 400Ω | " | 6.0MC | " | Tune for maximum output. | " | A11,A12 | Adjust for maximum output. |
| 9 | 400Ω | " | 7.2MC | " | Tuning cap. fully open. | " | A9 | " " " " |
| 10 | 400Ω | " | 23.5MC | SW 2 | " | " | A13 | " " " " |
| 11 | 400Ω | " | 21MC | " | Tune for maximum output. | " | A14, A15 | " " " " |

HOWARD W. SAMS & CO., INC. • • Indianapolis , Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1947 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-13 SET #46-FOLDER #13

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6SK7GT | 6SK7GT | 8N | |
| 2 | Converter | 6SA7 | 6SA7 | 8R | |
| 3 | IF Amp. | 6SK7 | 6SK7 | 8N | |
| 4 | Det.-AVC-AF | 6SQ7 | 6SQ7 | 8Q | |
| 5 | Phase Inverter | 6J5 | 6J5 | 6Q | |
| 6 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 7 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 8 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: KNIGHT PART No. | SOLAR PART No. | SPRAGUE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 9A | 40 | 450 | | DY-2x40-450 | EL-240 | | UP4445 | ■ Filter |
| B | 40 | 450 | | | | | | ▲ " |
| 10 | .05 | 400 | C13606 | S-4-05 | TC-15 | 484-05 | DT4S5 | Line Bypass |
| 11 | .002 | 600 | | S-6-002 | TC-12 | 684-002 | DT6D2 | Output Plate Bypass |
| 12 | .002 | 600 | | S-6-002 | TC-12 | 684-002 | DT6D2 | " " " |
| 13 | .25 | 400 | | S-4-25 | TC-2 | 484-.25 | DT4P25 | Plate Decoupling |
| 14 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | Audio Coupling |
| 15 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | " " |
| 16 | .02 | 400 | | S-4-02 | TC-12 | 484-02 | DT4S2 | " " |
| 17 | .001 | 600 | | S-6-001 | TC-21 | 684-001 | DT6D1 | Tone Compensation |
| 18 | .002 | 600 | | S-6-002 | TC-22 | 684-002 | DT6D2 | " " |
| 19 | .005 | 400 | | S-6-005 | TC-25 | 484-005 | DT6D4 | Audio Coupling |
| 20 | .001 | 600 | | S-6-001 | TC-21 | 684-001 | DT6D1 | Tone Compensation |
| 21 | .01 | 200 | | S-4-01 | TC-11 | 484-01 | DT4S1 | Audio Coupling |
| 22 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | IF Screen Bypass |
| 23 | .03 | 400 | | S-4-03 | TC-13 | 484-03 | DT4S3 | Plate Decoupling |
| 24 | .05 | 200 | | S-4-05 | TC-15 | 484-05 | DT4S5 | IF Cath. Bypass |
| 25 | .01 | 400 | | S-4-01 | TC-11 | 484-01 | DT4S1 | AVC Filter |
| 26 | .01 | 400 | | S-4-01 | TC-11 | 484-01 | DT4S1 | Conv. Screen Bypass |
| 27 | .05 | 200 | | S-4-05 | TC-15 | 484-05 | DT4S5 | AVC Filter |
| 28 | .02 | 200 | | S-4-02 | TC-12 | 484-02 | DT4S2 | Conv. Grid Filter |
| 29 | .01 | 400 | | S-4-01 | TC-11 | 484-01 | DT4S1 | RF Screen Bypass |
| 30 | .03 | 400 | | S-4-03 | TC-13 | 484-03 | DT4S3 | RF Cath. Bypass |
| 31 | .005 | 400 | | S-6-005 | TC-25 | 484-005 | DT6D5 | Ext. Ant. Coupling |
| 32 | 250 | 500 | | MO.5-325 | 1FM-325 | 1468-00025 | 5W5T25 | Audio Plate Bypass |
| 33 | 6800 | 300 | | | | | | Tone Compensation |
| 34 | 100 | 500 | | MO.5-31 | 1FM-31 | 1468-0001 | 5W5T1 | " " |
| 35 | 100 | 500 | | MO.5-31 | 1FM-31 | 1468-0001 | 5W5T1 | Osc. Grid Capacitor |
| 36 | 500 | 500 | | MOS.5-35 | MS-35 | 1468-0005 | 5R5T5 | Fixed Padder |
| 37 | 4000 | 300 | | MW.5-24 | 1FM-24 | 1467-004 | 1D5D4 | " " |
| 38 | 3 | 500 | | | | | | RF Coupling |
| 39 | 50 | 500 | | MO.5-45 | 1FM-45 | 1468-00005 | 5W5Q5 | RF Pri. Shunt |
| 40 | 6800 | 300 | | | | | | RF Coupling |

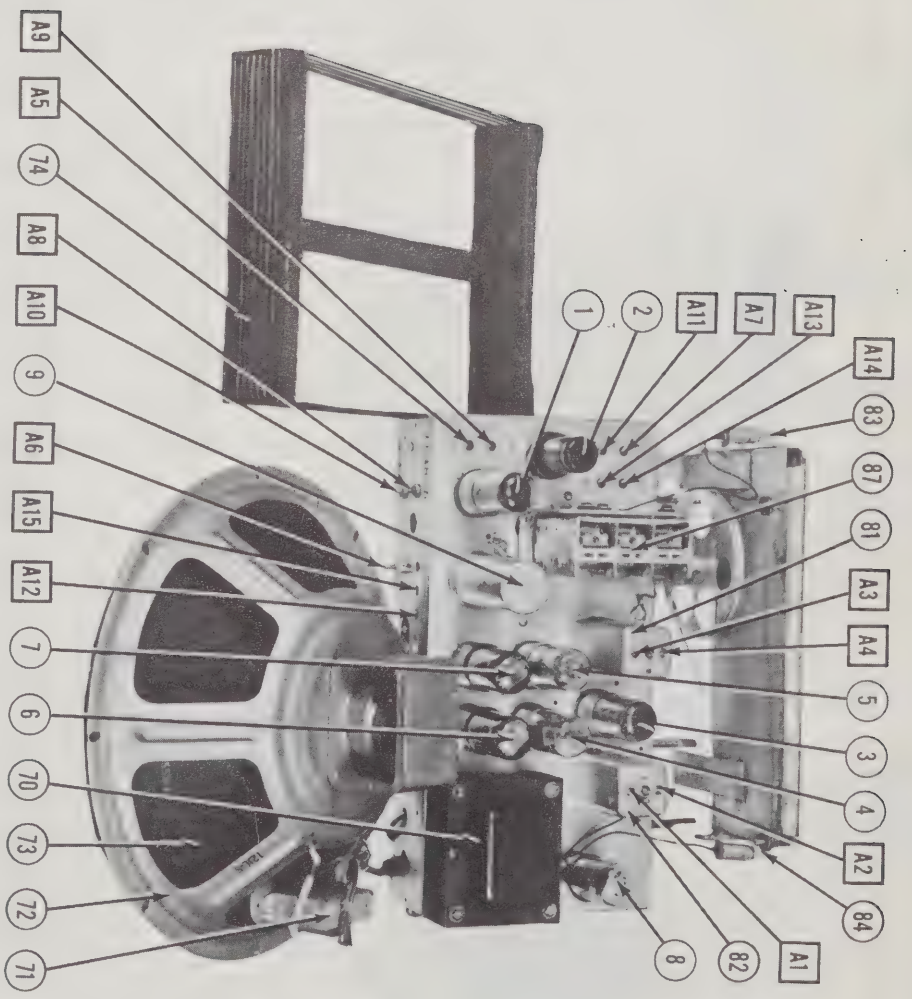
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: KNIGHT PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 41A | 500KΩ | 1 | X13371 | D18-133X | T-88 | Volume Control |
| B | Shaft | | | A | Not Req. | Attach to 41A per instructions |
| C | Switch | | | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: KNIGHT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 42 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red Antenna Loading |
| 43 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. RF Grid |
| 44 | 270Ω | ½ | | BW-½-270 | Red-Vi.-Br. RF Cathode |
| 45 | 1.5 Meg. | ½ | | BTS-1.5 Meg. | Br.-Grn.-Grn. Converter Grid SW 2 |
| 46 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. Oscillator Grid |
| 47 | 8200Ω | ½ | | BTS-8200 | Gray-Red-Red Parasitic Suppressor |
| 48 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. AVC Network |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | KNIGHT PART No. | IRC PART No. | |
| 49 | 22KΩ | 2 | | BT-2-22K | Red-Red-Or. Converter Screen Dropping |
| 50 | 270Ω | ½ | | BW-½-270 | Red-Vi.-Br. IF Cathode |
| 51 | 22KΩ | 1 | | BTA-22K | Red-Red-Or. Screen Dropping |
| 52 | 2.2 Meg. | ‡ | | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 53 | 150KΩ | ‡ | | BTS-150K | Br.-Grn.-Yl. Diode Load |
| 54 | 330KΩ | ‡ | | BTS-330K | Or.-Or.-Yl. Diode Load |
| 55 | 470KΩ | ‡ | | BTS-470K | Yl.-Vi.-Yl. Series Phono |
| 56 | 2.2 Meg. | ‡ | | BTS-2.2 Meg. | Red-Red-Grn. Phono Shunt |
| 57 | 15 Meg. | ‡ | | BTS-15 Meg. | Br.-Grn.-Blue AF Grid |
| 58 | 470KΩ | ‡ | | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 59 | 22KΩ | ‡ | | BTS-22K | Red-Red-Or. Tone Compensation |
| 60 | 470KΩ | ‡ | | BTS-470K | Yl.-Vi.-Yl. Phase Inverter Grid |
| 61 | 4700Ω | ‡ | | BTS-4700 | Yl.-Vi.-Yl. Phase Inverter Cathode-See Note 1 |
| 62 | 47KΩ | ‡ | | BTS-47K | Yl.-Vi.-Or. Phase Inverter Cathode |
| 63 | 47KΩ | ‡ | | BTS-47K | Yl.-Vi.-Or. Phase Inverter Plate Load |
| 64 | 220KΩ | ‡ | | BTS-220K | Red-Red-Yl. Output Grid |
| 65 | 220KΩ | ‡ | | BTS-220K | Red-Red-Yl. " " |
| 66 | 120Ω | 2 | | BW-2-120 | Br.-Red-Br. Output Cathode |
| 67 | 4000Ω | 10 | X14.037 | WB-4000 | Filter |
| 68 | 47KΩ | ‡ | | BTS-47K | Yl.-Vi.-Or. " |
| 69 | 51Ω | ‡ | | BW-‡-56 | Grn.-Br.-Br. Parasitic Suppressor |

Note 1 - Some models use 3300Ω in this application. IRC replacement BTS-3300.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | KNIGHT PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 70 | 117V AC @ .78A | 640V CT @ .104A | 5.1V AC @ 2.0A | 6.5V AC @ 2.3A | X13370 | P-6013* | T22R06 | P-2964* |

*Add resistor to reduce plate voltage.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | KNIGHT PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 71 | 10500Ω CT | 4Ω | 560Ω CT | .7Ω | | A-3323 | T22S47* | A-2936 | *Drill one new mounting hole. |

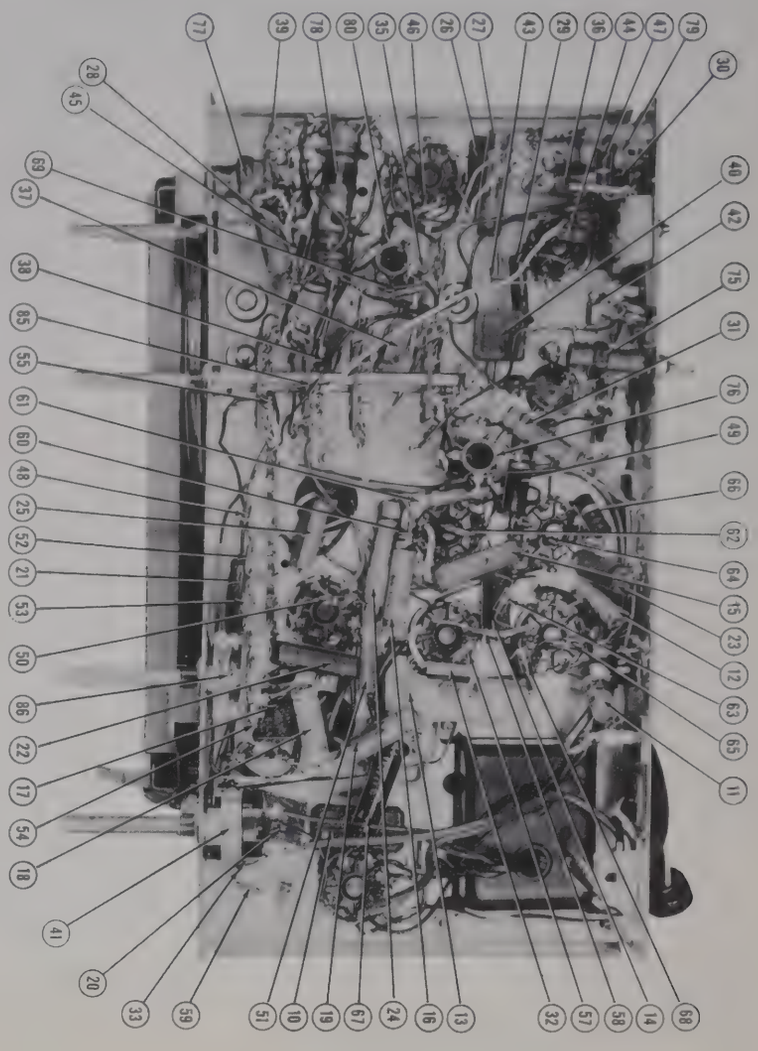
## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | KNIGHT PART No. | JENSEN PART No. | QUAM PART No. | |
| | FIELD | VC IMP. | | ST-102# | | #Replace output transformer to match 6-8Ω voice coil. |
| 72 | PM | 4Ω | | Mod. P12-S | 12A6# | |
| | CONE DIA. | VC DIA. | | | | |
| 73 | 11-7/8" | 1" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | KNIGHT PART No. | MEISSNER PART No. | |
| 74 | Loop Ant. | | .3Ω | X14495 | | |
| 75 | BC Ant. Loading Coil | | 2.3Ω | X13997 | | |
| 76A | SW Ant.Coil 1 | 1Ω | 0Ω | X13373 | | 76A & 76B wound on same form |
| B | " " " 2 | 0Ω | 0Ω | | | |
| 77 | BC RF Coil | 130Ω | 5Ω | X13374 | 14-1027 | |
| 78A | SW " " 1 | 27Ω | .5Ω | X13375 | | 78A & 78B " " " " |
| B | " " " 2 | 7Ω | 0Ω | | | |
| 79A | BC Osc. Coil | | 7Ω | X13376 | | 79A & 79B " " " " |
| B | SW " " 1 | | 2.5Ω | | | |
| 80 | SW " " 2 | | 0Ω | X13377 | 14-1046 | |
| 81 | Input IF | 25Ω | 25Ω | X13902 | 16-6658 | |
| 82 | Output IF | 13Ω | | X13903 | 16-6670 | |

## CHASSIS—BOTTOM VIEW




DATE 9/48-#4816-13 SET #46-FOLDER #13 - -

# PARTS LIST AND DESCRIPTIONS (Continued)

## DIAL LIGHT

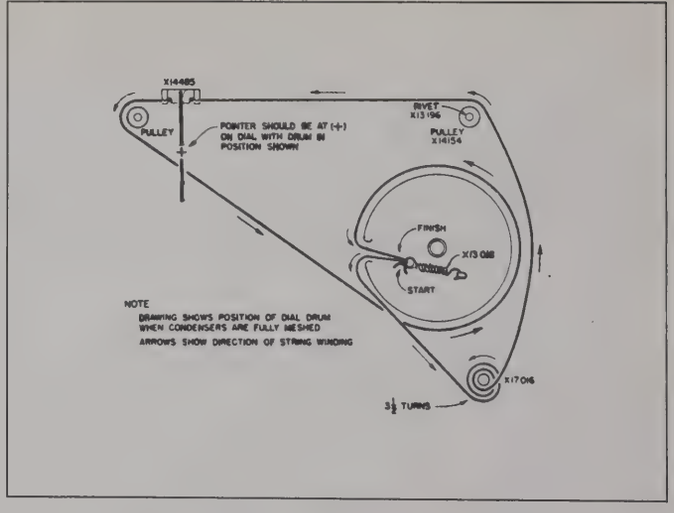
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | KNIGHT PART No. | | |
| 83 | Bayonet | 6-8 | 0.15 | Brown | | | Type 47 |
| 84 | " | " | " | " | | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | KNIGHT PART No. | NOTES |
|---|---|---|---|
| 85 | Switch | X13378 | Band-Bass-Phono |
| 86 | Tone Switch | X13379 | |
| 87 | 3 Gang Var. Cap. | X13385 | 15-479 MMF (each section) |
| | Dial Glass | X3.087 | |
| | Dial Pointer | X14485 | |

## PHONO CARTRIDGE

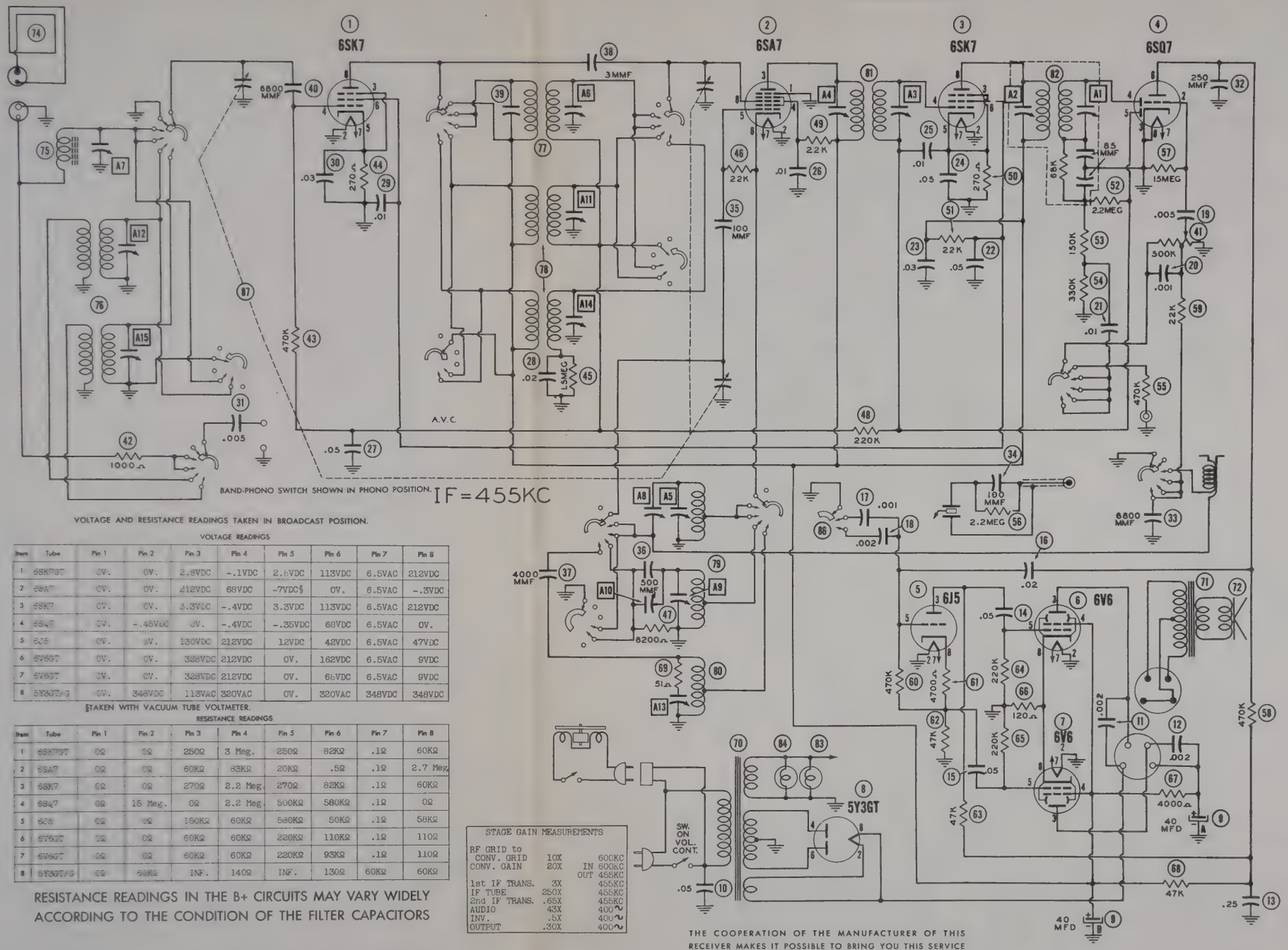
| ITEM No. | REPLACEMENT DATA | | REMARKS |
|---|---|---|---|
| | KNIGHT PART No. | ASTATIC PART No. | |
| 88 | X28.012-1 | L-70-A | |




DISASSEMBLY INSTRUCTIONS

1. Remove four control knobs from front of cabinet.
2. Remove speaker plug from chassis.
3. Remove phono-motor plug from receptacle.
4. Remove phono-pickup plug from chassis.
5. Remove loop antenna plug from chassis.
6. Remove four chassis mounting bolts. Remove chassis.
7. Remove 14 self-tapping screws holding bottom shield to chassis. Remove shield.
8. Remove four hex nuts holding speaker. Remove speaker.
9. Remove two bolts holding antenna in brackets. Remove loop antenna.

DATE 9/48-#4816-13 SET #46-FOLDER #13


1
6SK7
2
6SA7
3
6SK7
4
6SQ7
6800 MMF
.03
270Ω
.01
3MMF
22K
100 MMF
.01
.05
.03
.005
470K
1000Ω
.05
A.V.C.
1.5MEG
.02
220K
.001
.002
100 MMF
2.2MEG
6800 MMF
.02
4000 MMF
500 MMF
8200Ω
51Ω
.05
SW. ON VOL. CONT.
5Y3GT
8
6J5
6V6
7
6V6
.05
470K
4700Ω
220K
120Ω
220K
47K
.05
47K
.002
.002
4000Ω
40 MFD
A
9
40 MFD
B
9
47K
.25
13
470K
58
.005
250 MMF
85 MMF
68K
2.2MEG
15MEG
150K
330K
.01
500K
.001
22K
470K
55
.25
.05
.05
.01
.03
.05
22K
.03
.05
22K
.01
.05
270Ω
68K
.01
.005
500K
.001
22K
.01

MAGNAVOX CHASSIS MODELS
CR190A, CR190B

MAGNAVOX CHASSIS MODEL CR-190B

| | |
|---|---|
| **TRADE NAME** | Magnavox, Chassis Models CR-190A, CR-190B |
| **MANUFACTURER** | Magnavox Co., 2131 Bueter Rd., Fort Wayne, Ind. |
| **TYPE SET** | AC Operated 2 Band Superheterodyne Receiver with Loop Ant. |
| **TUBES** (NINE) | Types, 6SA7 Converter, 6SK7GT IF Amp., 6J5 Det.-AVC, 6U5/6G5 Tuning Eye, 6J5 AF Amp., 6SN7GT AF-Phase Inv., (2) 6V6 Power Output, 5Y3GT Rectifier |
| **POWER SUPPLY** | 110-120 Volts AC — RATING .80 Amp. @ 117 Volts AC |
| **TUNING RANGE—BROADCAST** | 545-1620KC — **SHORT WAVE** 5.5-18.3MC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

Treble control should be at sharp tune, volume control at maximum, and output of sig. gen. no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for all adjustments.

In Step 8 if an audio oscillator is not available, turn band switch to BC and tune receiver to a point between two stations on adjacent channels having approximately the same power. If A12 is out of adjustment a 10KC whistle will be heard. Adjust A12 until whistle is at minimum.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | 250MMFD | High side to Pin 5 (Osc. Grid) of 6SA7. Low side to chassis. | 455KC | BC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. |
| 2 | 250MMFD | High side to ant terminal. Low side to chassis. (Ant. loop switch (89) in ant. position.) | 600KC | " | Tune for maximum output. | " | A5 | Rock tuning cap. and adjust for maximum output. |
| 3 | 250MMFD | " | 1400KC | " | 1400KC | " | A6 | Adjust for maximum output. |
| 4 | 250MMFD | " | " | " | Tune for maximum output. | " | A7 | Adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made. |
| 5 | 400Ω carbon res. | " | 15MC | SW | 15MC | " | A8 | Tighten A8 firmly and open to first peak. Adjust for maximum output. |
| 6 | " | " | " | " | Tune for maximum output. | " | A9 | Rock tuning cap. and adjust for maximum output. |
| 7 | | Ant. loop switch in loop position. Use radiation loop. | 1400KC | BC | " | " | A11 | Turn treble control to sharp tune. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 8 | | High side to phono jack. Low side to chassis. | 10,000 ∿ (Audio Gen.) | Phono | | " | A10 | Turn treble control to full range. Adjust A10 for minimum output. If an audio gen. is not available see prealignment instructions for adjust of A12. Reassemble receiver in cabinet. |

PUSHBUTTON ADJUSTMENTS

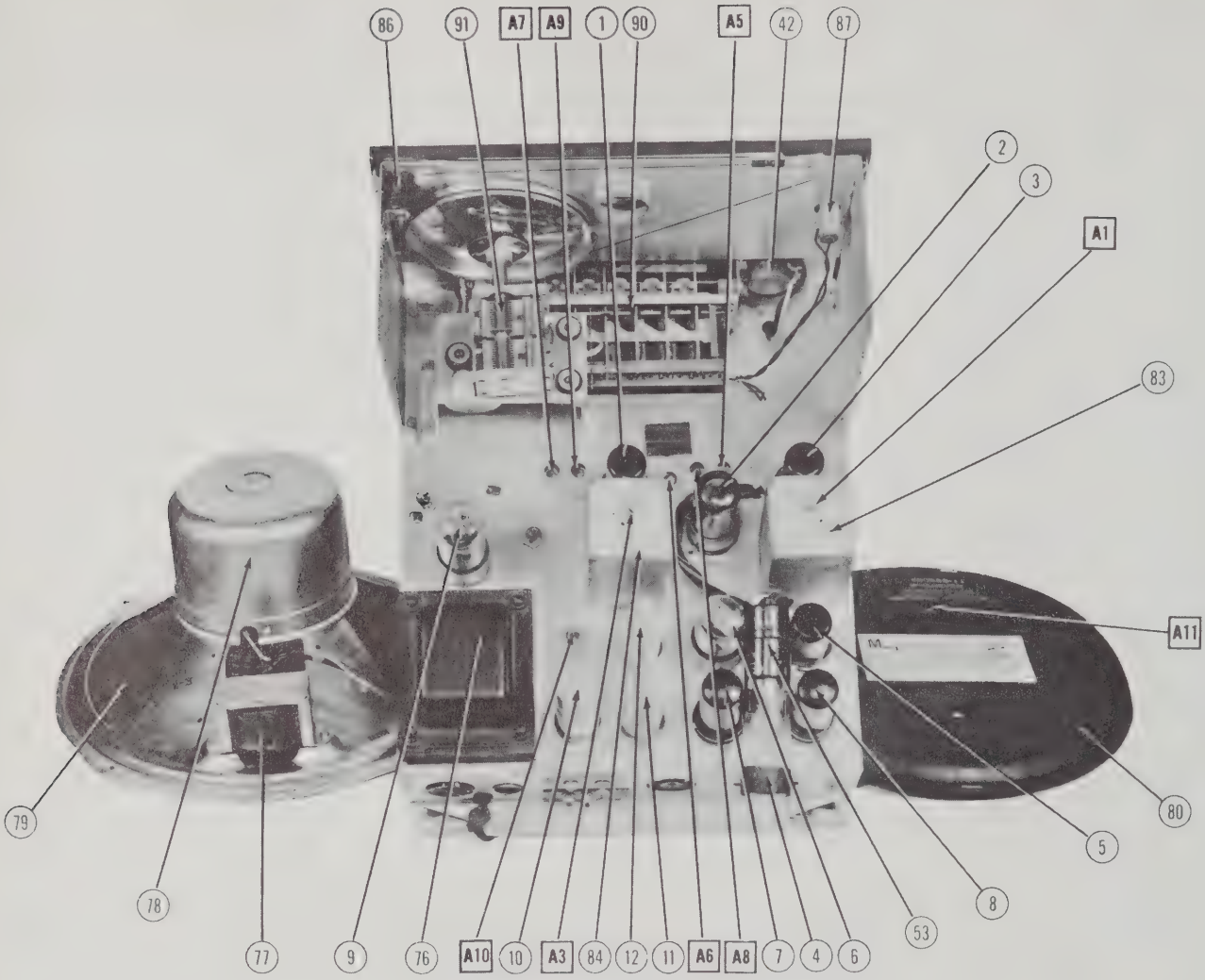
The frequency ranges of the five buttons in order from left to right are:

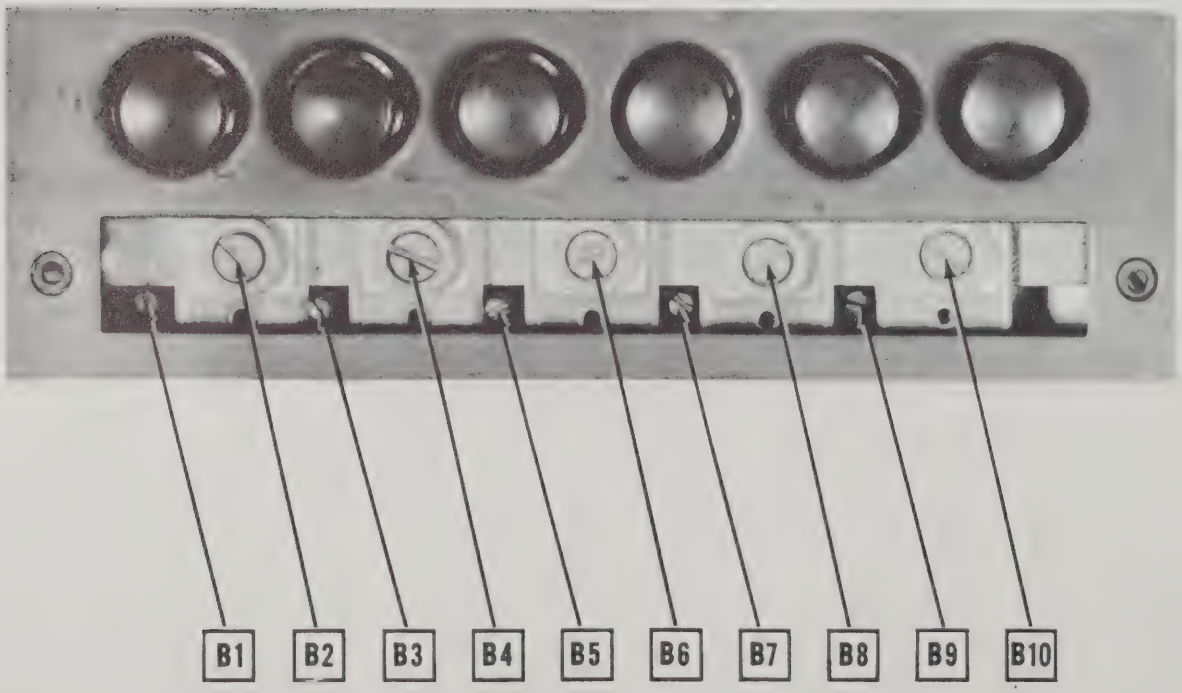
530-110KC, 530-1100KC, 530-1100KC, 930-1600KC and 930-1600KC.

1. Turn receiver on and allow it to warm up for at least fifteen minutes.
2. Make up a list of stations desired to be set up making sure that each station falls within the frequency range of its button.
3. Remove call letter mounting plate.
4. Turn bandswitch to BC and depress "dial" button.
5. Manually tune in the first station desired to be set up using tuning eye shadow for accuracy.
6. Depress the first button desired to be set up and adjust B1 to tune in first station.
7. Adjust B2 for minimum tuning eye shadow. First button is now set up.
8. To set up the remaining buttons follow the procedure outlined above adjusting B3, B5, B7 and B9 to tune in station, and B4, B6, B8 and B10 for minimum tuning eye shadow.

**HOWARD W. SAMS & CO., INC.** **Indianapolis Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


86
91
A7
A9
1
90
A5
42
87
2
3
A1
83
A11
80
5
8
53
79
78
77
9
76
A10
10
A3
84
12
11
A6
A8
7
4
6


B1
B2
B3
B4
B5
B6
B7
B8
B9
B10

MAGNAVOX CHASSIS MODELS
CR190A, CR190B PAGE 3
A4
A2

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: MAGNAVOX PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | Converter | 6SA7 | 6SA7 | 8R | |
| 2 | IF Amp. | 6SK7GT | 6SK7GT | 8N | |
| 3 | Det.-AVC | 6J5 | 6J5 | 6A | |
| 4 | Tuning Eye | 6U5/6G5 | 6U5/6G5 | 6R | |
| 5 | AF Amp. | 6J5 | 6J5 | 6A | |
| 6 | AF-Phase Inv. | 6SN7GT | 6SN7GT | 8BD | |
| 7 | Power Output | 6V6 | 6V6 | 7AC | |
| 8 | Power Output | 6V6 | 6V6 | 7AC | |
| 9 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA: MAGNAVOX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 10A | 30 | 475 | | | UP3145 | DY-3x15-450# | EL-344# | ■ Filter |
| B | 10 | 475 | | | | | | ▲ Filter |
| 11A | 10 | 450 | 27002306* | AF22J4A* | UP1145C* | DY-10-450/25-50 | EL-202* | ■ Decoupling |
| B | 20 | 25 | | | | | | ▲ Cathode Bypass |
| 12A | 10 | 450 | 27002306* | AF22J4A* | UP1145C* | DY-10-450/25-50 | EL-202* | ■ Decoupling |
| B | 20 | 25 | | | | | | ▲ Cathode Bypass |
| 13 | 20 | 25 | 27002702 | PRS25/20 | BR202A | M-20-25 | TA-25 | Inverter Cathode Bypass |
| 14 | .02 | 500 | 25012903 | 684-02 | DT6S2 | MPH-6-02 | TC-12 | Line Filter |
| 15 | .02 | 500 | 25012903 | 684-02 | DT6S2 | MPH-6-02 | TC-12 | " " |
| 16 | .01 | 600 | 25015203 | 684-01 | DT6S1 | ST-6-01 | TC-11 | Tone Comp. |
| 17 | .01 | 200 | 25015201 | 484-01 | DT2S1 | ST-4-01 | TC-11 | " " |
| 18 | .1 | 400 | 25015202 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | Audio Coupling |
| 19 | .02 | 400 | 25015202 | 484-02 | DT4S2 | ST-4-02 | TC-12 | " " |
| 20 | .003 | 600 | 25015203 | 684-003 | DT6D3 | ST-6-003 | TC-23 | Tone Comp. |
| 21 | .01 | 600 | 25015201 | 684-01 | DT6S1 | ST-6-01 | TC-11 | " " |
| 22 | .1 | 400 | 25015202 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | RF Bypass Pwr. Supply |
| 23 | .05 | 200 | 25015201 | 484-05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 24 | .01 | 200 | 25015201 | 484-01 | DT2S1 | ST-4-01 | TC-11 | Audio Coupling |
| 25 | .05 | 200 | 25015201 | 484-05 | DT2S5 | ST-4-05 | TC-15 | IF Cathode Bypass |
| 26 | .1 | 200 | 25015201 | 484-.1 | DT2P1 | ST-2-1 | TC-1 | Screen Bypass |
| 27 | .05 | 200 | 25015201 | 484-05 | DT2S5 | ST-4-05 | TC-15 | Tuning Ind. Grid Filter |
| 28 | .05 | 200 | 25015201 | 484-05 | DT2S5 | ST-4-05 | TC-15 | Conv. Cathode Bypass |
| 29 | .01 | 600 | 25015203 | 684-01 | DT6S1 | ST-6-01 | TC-11 | Ext. Ant. Isolation |
| 30 | 1000 | 500 | 25016008 | 1468-0001 | 5W5D1 | MO.5-21 | 1FM-21 | Tone Comp. |
| 31 | 100 | 500 | 25015902 | 1469-0001 | 5R5T1 | MOS.5-31 | MS-31 | Phono Coupling |
| 32 | 330 | 500 | 25015908 | 1468-0003 | 5W5T3 | MO.5-33 | 1FM-33 | Phono Tone Comp. |
| 33 | 220 | 500 | 25015910 | 1468-0002 | 5W5T2 | MO.5-32 | 1FM-32 | AF Plate Bypass |
| 34 | 1800 | 500 | 25016007 | 1467-002 | 1W5D2 | MW.5-22 | 1FM-22 | Audio Coup. |
| 35 | 470 | 500 | 25015910 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Tone Comp. |
| 36 | 270 | 500 | 25015908 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | Feedback |
| 37 | 100 | 500 | 25015908 | 1468-0001 | 5R5T1 | MOS.5-31 | MS-31 | Diode RF Filter |
| 38 | 220 | 500 | 25015910 | 1469-0002 | 5R5T2 | MOS.5-32 | MS-32 | " " " |
| 39 | 529 | 500 | 25008503 | | | | | Fixed Padder |
| 40 | 50 | 300 | 25008802 | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Osc. Grid Cap.-Cer. |
| 41 | 5600 | 500 | 25016107 | | | | | Grid Leak Cap. |

*Omit one section.
#Parallel sections to obtain desired capacity.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA: MAGNAVOX PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 42A | 1 Meg. | ½ | 22004402 | D13-137 | M-63-Z | Volume Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 42A per instructions |
| 43A | 1 Meg. | ½ | 22004502 | D13-137 | M-63-Z | Bass Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 43A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " |
| 44 | 1 Meg. | ½ | 22007102 | | | Treble Control & Band Exp. Sw. |

# PARTS LIST AND DESCRIPTIONS (Continued)

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: MAGNAVOX PART No. | REPLACEMENT DATA: MEISSNER PART No. | |
|---|---|---|---|---|---|---|
| 80 | Loop Ant. | | .9Ω | | | Order by style number of cabinet. |
| 81A | BC RF Coil | 22.3Ω | 3Ω | 360256-G1 | | |
| B | SW RF " | 0Ω | 0Ω | | | |
| 82A | BC Osc.Coil | | 4.5Ω | 360255-G1 | | |
| B | SW " " | | 0Ω | | | |
| 83 | Input IF | 7Ω | 6.5Ω | 360266-G1 | | |
| 84 | Output IF | 7.5Ω | 7.5Ω | 360267-G1 | 16-6645 | |
| 85 | 10KC Filter Choke | | 530Ω | 360240-G1 | | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA: MAGNAVOX PART No. | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| 86 | Bayonet | 7.5 | 0.2 | White | | | Type 51 |
| 87 | " | 7.5 | 0.2 | " | | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | MAGNAVOX PART No. | NOTES |
|---|---|---|---|
| 88 | Switch | 160156-G1 | Band-Phono |
| 89 | " | 160157-G1 | |
| 90 | Pushbutton Assy | | |
| 91 | 2 Gang Var. Cap | 260056-G1 | (50-523MMF) each section |
| A8 | Trimmer Strip | 260021-G1 | (SW Osc. Adj. |
| A9 | | | (SW Ant. Adj. |
| A10 | Trimmer | 260008-G1 | 10KC Adj. |

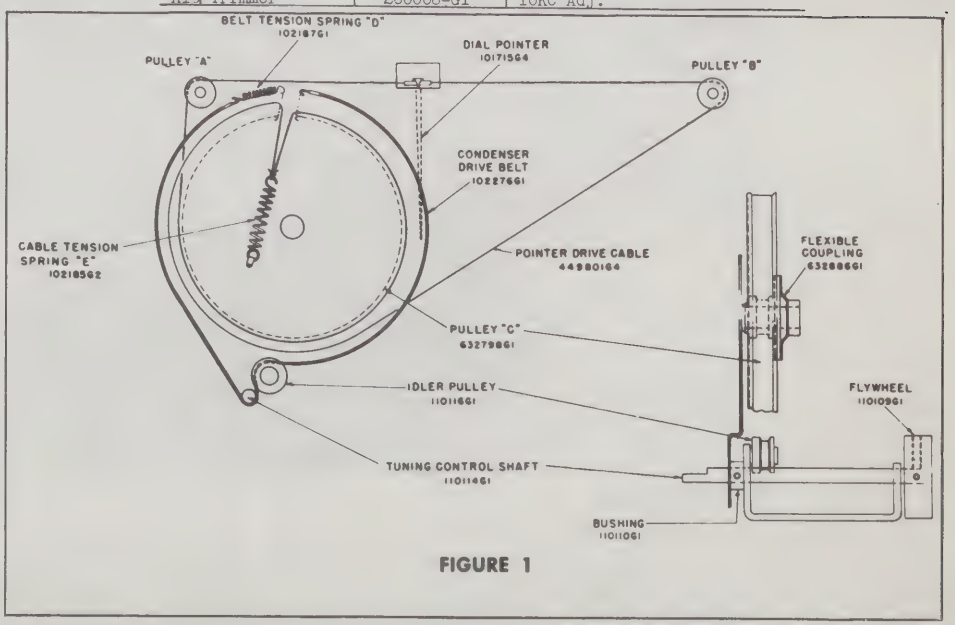



FIGURE 1

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MAGNAVOX PART No. | IRC PART No. | |
| 45 | 470KΩ | ½ | 230084G29 | BTS-470K | Yl.-Vi.-Yl. Conv. Grid Leak |
| 46 | 150Ω | ½ | 230084G8 | | Br.-Grn.-Br. Conv. Cathode |
| 47 | 22KΩ | ½ | 230084G21 | BTS-22K | Red-Red-Or. Osc. Grid |
| 48 | 220Ω | ½ | 230084G9 | | Red-Red-Br. Parasitic Supp. |
| 49 | 15KΩ | ½ | 230084G20 | BTS-15K | Br.-Grn.-Or. Sw. Osc. Coil Shunt |
| 50 | 470KΩ | ½ | 230084G29 | BTS-470K | Yl.-Vi.-Yl. AVC Network |
| 51 | 470KΩ | ½ | 230084G29 | BTS-470K | Yl.-Vi.-Yl. " " |
| 52 | 1 Meg. | ½ | 230084G31 | BTS-1 Meg. | Br.-Blk.-Grn. " " |
| 53 | 1 Meg. | 2 | 230084G31 | BTS-1 Meg. | Br.-Blk.-Grn. Tuning Eye Plate Load |
| 54 | 470Ω | ½ | 230084G11 | BTS-470 | Yl.-Vi.-Br. IF Cathode |
| 55 | 10KΩ | 10 | 240035G2 | AB-10,000 | Br.-Blk.-Or. Voltage Dropping |
| 56 | 15KΩ | 1 | 230085G20 | BTA-15K | Br.-Grn.-Or. Bleeder |
| 57 | 22KΩ | ½ | 230084G21 | BTS-22K | Red-Red-Or. Diode Filter |
| 58 | 150KΩ | ½ | 230084G26 | BTS-150K | Br.-Grn.-Yl. Diode Load |
| 59 | 4700Ω | ½ | 230084G17 | BTS-4700 | Yl.-Vi.-Red 1st AF Cathode |
| 60 | 150KΩ | ½ | 230084G26 | BTS-150K | Br.-Grn.-Yl. 1st AF Plate Load |
| 61 | 4700Ω | ½ | 230084G17 | BTS-4700 | Yl.-Vi.-Red 1st AF Plate Decoup. |
| 62 | 15KΩ | 1 | 230085G20 | BTA-15K | Br.-Grn.-Or. Tone Comp. |
| 63 | 100KΩ | ½ | 230084G25 | BTS-100K | Br.-Blk.-Yl. " " |
| 64 | 470KΩ | ½ | 230084G29 | BTS-470K | Yl.-Vi.-Yl. " " |
| 65 | 47KΩ | ½ | 230084G23 | BTS-47K | Yl.-Vi.-Or. 2nd AF Grid |
| 66 | 1500Ω | ½ | 230084G14 | BTS-1500 | Br.-Grn.-Red 2nd AF Cathode |
| 67 | 100KΩ | ½ | 230084G25 | BTS-100K | Br.-Blk.-Yl. 2nd AF Plate Load |
| 68 | 100KΩ | ½ | 230084G25 | BTS-100K | Br.-Blk.-Yl. Ph. Inv. Plate Load |
| 69 | 15KΩ | ½ | 230084G187 | BTS-15K | Br.-Grn.-Or. Ph. Inv. Grid |
| 70 | 4700Ω | ½ | 230084G17 | BTS-4700 | Yl.-Vi.-Red Decoupling |
| 71 | 220KΩ | ½ | 230084G215 | BTS-220K | Red-Red-Yl. Output Grid |
| 72 | 270KΩ | ½ | 230084G91 | BTS-270K | Red-Vi.-Yl. " " |
| 73 | 4.7 Meg. | ½ | 230084G35 | BTS-4.7 Meg. | Yl.-Vi.-Grn. Feedback |
| 74 | 220Ω | 2 | 230064G54 | BW-2-220 | Red-Red-Br. Output Cathode |
| 75 | 15KΩ | 1 | 230085G20 | BTA-15K | Br.-Grn.-Or. Tone Comp. |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | MAGNAVOX PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 76 | 117V AC @ .8A | 740V CT .097ADC | 5.1V CT @ 2.0A | 6.4V CT @ 3.3A | C300025G1 | P-6014 | T22R05 | P-2954 |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | MAGNAVOX PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 77 | 7500Ω CT | 3.6Ω | 400Ω CT | .3Ω | Part of 582806 | A-3824 | T22S58 | A-2904‡ | ‡Drill new mounting holes. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD RES. | VC IMP. | MAGNAVOX PART No. | JENSEN PART No. | QUAM PART No. | |
| 78 | 1000Ω | 3.6Ω | 582806 | | 12E10† | †Replace output transformer to match 6-8Ω voice coil. |
| | CONE DIA. | VC DIA. | | | | |
| 79 | 11½" | 1" | | | | |

Two type of drive mechanisms are used to transmit the motion from the dial tuning knob to the large pulley that is coupled to the condenser gang. These two arrangements are shown on Figures 1 and 2. The cable used to drive the dial pointer is strung the same on all CR-190A and CR-190B receivers. Separate instructions for installing a replacement belt or string on the CR-190A or CR-190B chassis are given below.

CR-190A Condenser Drive Belt Replacement-Hook one end of the belt on the right hand edge of the slot in pulley "C" so that the smooth side contacts the pulley surface. Keeping the belt near the back of the groove in pulley "C" wrap it in a clockwise direction around that pulley (as indicated by the arrows on Figure 1) over the idler pulley and under the tuning control shaft; then around the opposite side of pulley "C". One end of the belt tension spring is hooked on the free end of the belt and the other end on the left-hand edge of the slot in pulley "C", completing the operation.

CR-190B Condenser Drive Belt Replacement-Slide a short length (approximately 1/2-inch) of sleeving over one end of a 19-inch length of dial cable, form a small loop and tie a knot in the manner shown on Figure 2. Hook this loop over the metal hook in pulley "C" and lace the cable through the pulley slot and around the pulley in a counter-clockwise direction when viewed from the rear of the panel, keeping the cable to the rear of the pulley groove. Lace the cable in the direction indicated by the arrow on Figure 2 wrapping 2½ turns around the smaller diameter portion of the tuning control shaft from front to back; then around the opposite side of pulley "C". Loop one end of tension spring "D" on the righthand edge of the slot in pulley "C"; thread the free end of the drive cable through the opposite end of spring-"D" and pull back on the cable until the spring coils are stretched to approximately one inch. Tie a double knot in the cable while maintaining tension on the spring, completing the operation.

CR-190A and CR-190B Dial Pointer Drive Cable Replacement-Rotate the tuning control shaft until the slot in the groove of pulley "C" is up. Cut a piece of dial cable approximately 40 inches long and slide a short piece of sleeving over the cable. Tie a small loop in one end of the cable and temporarily hook it over the metal hook in pulley "C". Lace the other end through the slot in the pulley groove and in a counter-clockwise direction around the large pulley, then around pulley "B" and straight across the back of the dial frame; over pulley "A" and in a counter-clockwise direction around pulley "C". This last wrap around pulley "C" must be at the front of the pulley groove or nearest the panel. This is important. Lace the free end of the cable through the slot in pulley "C" and remove the other end of the cable from the hook. Fasten one end of tension spring "E" over the pulley hook and lace the two free ends of the drive cable through the other end of the spring. Now pull back on the cable until the tension spring coils are stretched to approximately 1-5/8"inches. Tie a double knot in the cable while maintaining tension on the spring.

Turn the tuning control shaft until the condenser gang is completely meshed and slide the dial pointer on its track until it is in line with the last calibration mark at the low frequency end of the dial. The short piece of sleeving installed prior to the stringing operation should be slid to the rear of the dial pointer and the crimping lugs on the dial pointer pressed together over the sleeving. After checking to see that the condenser gang is still completely meshed and the dial pointer is in the position specified previously, apply a few drops of cement to each end of the sleeving to which the dial pointer is fastened. This completes the operation.

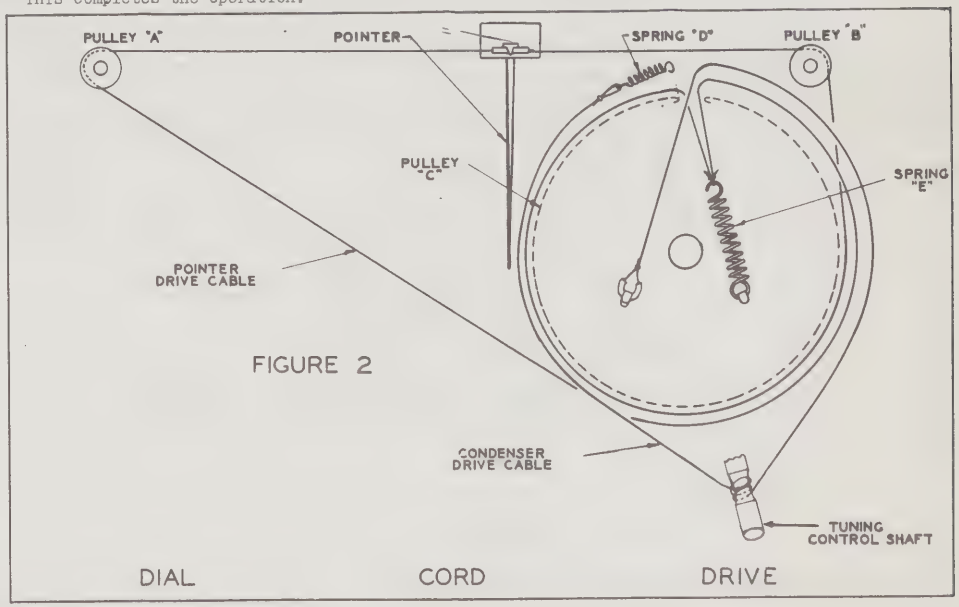
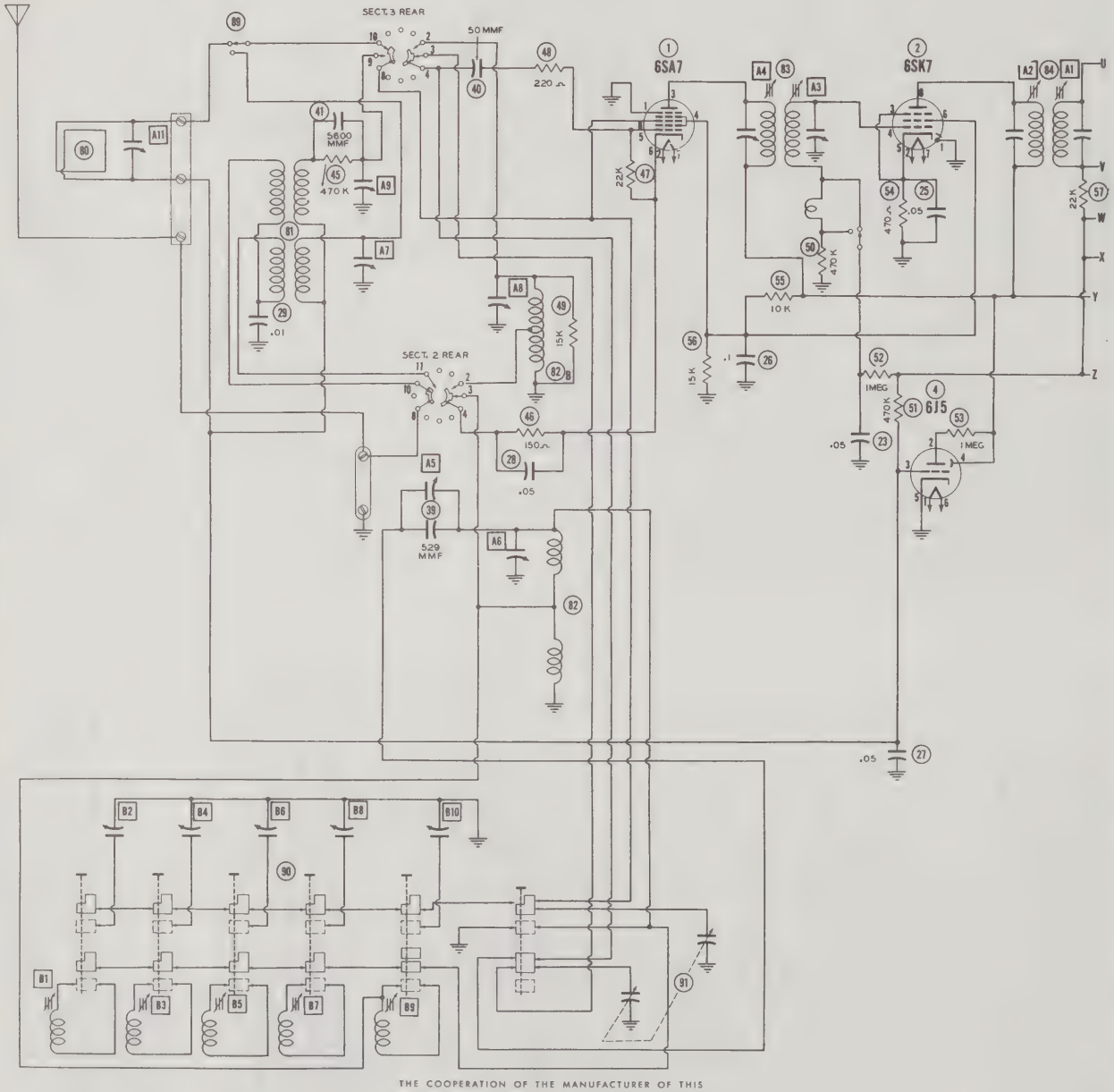


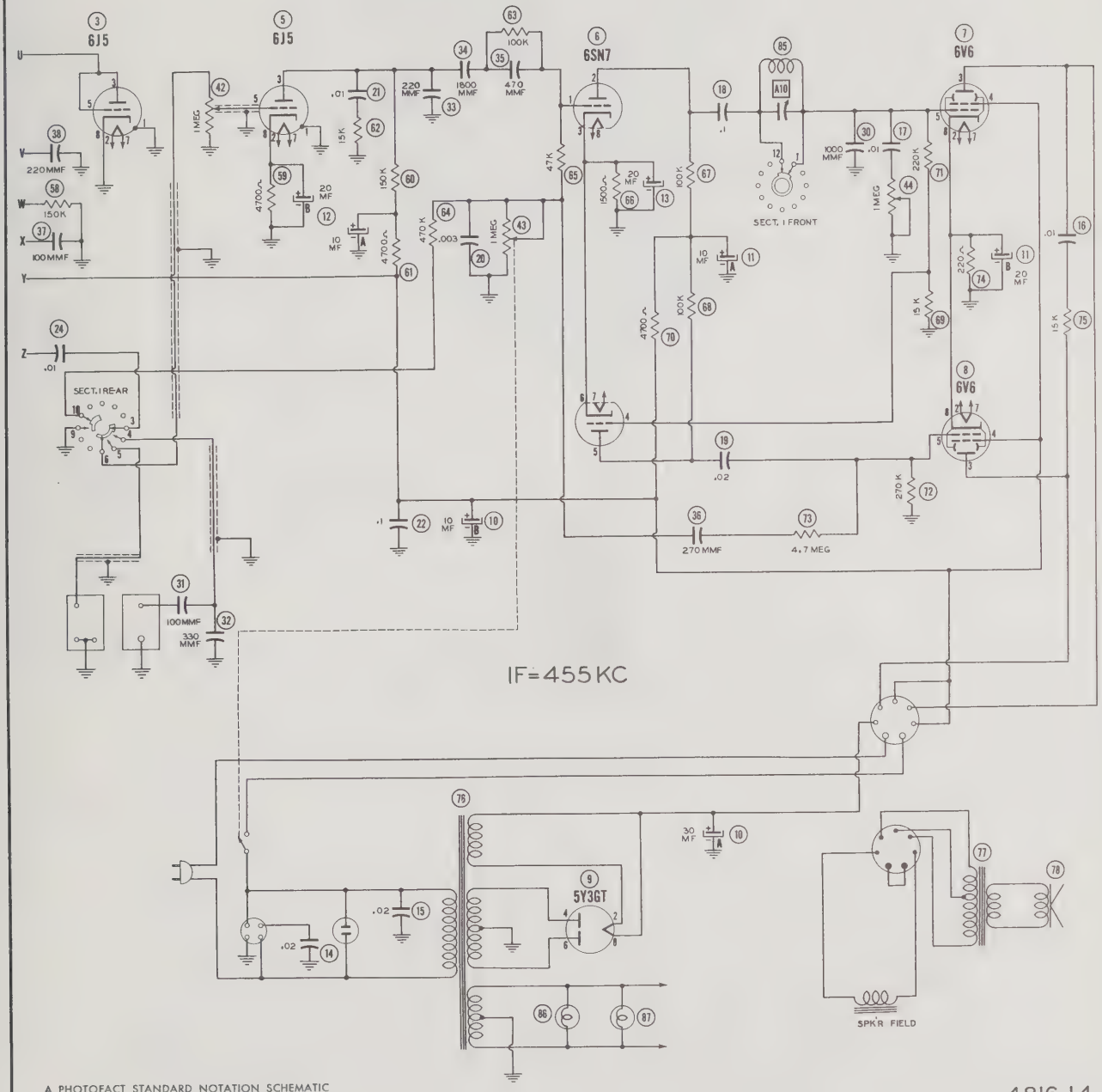

FIGURE 2

DATE 9/48-#4816-14 SET #46-FOLDER #14




A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948




A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

4816-14

## VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

### VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SA7 | 0V. | 3.2VAC | 260VDC | 100VDC | -6.4VDC | 1.6VDC | 3.2VAC | -.8VDC |
| 2 | 6SK7GT* | 0V. | 3.2VAC | 3.6VDC | -.1VDC | 3.6VDC | 100VDC | 3.2VAC | 260VDC |
| 3 | 6J5 | 0V. | 3.2VAC | -.6VDC | 260VDC | -.6VDC | 0V. | 3.2VAC | 0V. |
| 4 | 6U5/6G5 | - | - | - | - | - | - | - | - |
| 5 | 6J5 | 0V. | 3.2VAC | 110VDC | 0V. | 0V. | 260VDC | 3.2VAC | 5VDC |
| 6 | 6SN7GT | 0V. | 100VDC | 4VDC | 0V. | 100VDC | 4VDC | 3.2VAC | 3.2VAC |
| 7 | 6V6 | 0V. | 3.2VAC | 250VDC | 260VDC | 0V. | 250VDC | 3.2VAC | 16VDC |
| 8 | 6V6 | 0V. | 3.2VAC | 250VDC | 260VDC | 0V. | 250VDC | 3.2VAC | 16VDC |
| 9 | 5Y3GT | 0V. | 370VDC | 0V. | 370VAC | 0V. | 370VAC | 0V. | 370VDC |

§TAKEN WITH VACUUM TUBE VOLTMETER.

### RESISTANCE READINGS

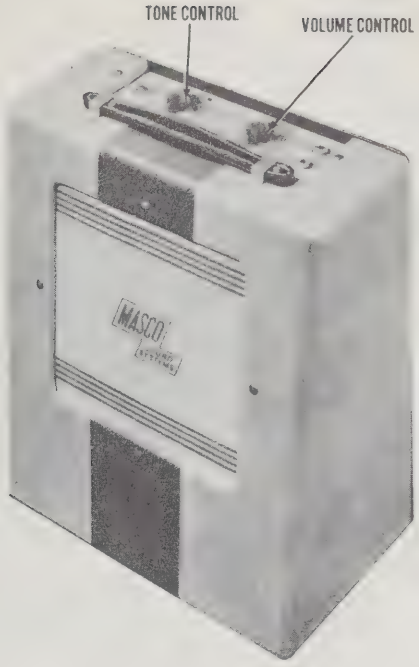
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SA7 | 0Ω | .05Ω | 30KΩ | 15KΩ | 22KΩ | 150Ω | .05Ω | 650KΩ |
| 2 | 6SK7GT | 0Ω | .05Ω | 470Ω | 470KΩ | 470Ω | 15KΩ | .05Ω | 30KΩ |
| 3 | 6J5 | 0Ω | .05Ω | 170KΩ | 30KΩ | 170KΩ | 0Ω | .05Ω | 0Ω |
| 4 | 6U5/6G5 | - | - | - | - | - | - | - | - |
| 5 | 6J5 | 0Ω | .05Ω | 180KΩ | 5 Meg. | 1 Meg. | 30KΩ | .05Ω | 4.7KΩ |
| 6 | 6SN7GT | 1 Meg. | 130KΩ | 1.5KΩ | 15KΩ | 130KΩ | 1.5KΩ | .05Ω | .05Ω |
| 7 | 6V6 | 0Ω | .05Ω | 30KΩ | 30KΩ | 240KΩ | 30KΩ | .05Ω | 220Ω |
| 8 | 6V6 | 0Ω | .05Ω | 30KΩ | 30KΩ | 270KΩ | 40KΩ | .05Ω | 220Ω |
| 9 | 5Y3GT | INF. | 30KΩ | INF. | 105Ω | INF. | 115Ω | INF. | 30KΩ |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

| STAGE GAIN MEASUREMENTS | | | |
|---|---|---|---|
| ANTENNA TO CONVERTER GRID | 3X | | 455KC |
| CONVERSION GAIN | 20X | IN | 600KC |
| | | OUT | 455KC |
| INPUT IF TRANSFORMER | 1X | | 455KC |
| IF TUBE | 250X | | 455KC |
| OUTPUT IF TRANSFORMER | .6X | | 455KC |
| 1st AUDIO | 12X | | 400 ∿ |
| 2nd AUDIO | 12X | | 400 ∿ |
| OUTPUT | 15X | | 400 ∿ |

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.




MASCO MODEL
MAP-120N

MASCO MODEL
MAP-120N

MASCO MODEL MAP-120N

| | |
|---|---|
| **TRADE NAME** | Masco, Model MAP-120N |
| **MANUFACTURER** | Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N.Y. |
| **TYPE SET** | AC Operated Musical Instrument Amplifier |
| **TUBES** (FIVE) | Types, 6SL7GT AF Amp., 6SL7GT AF-Phase Inv., (2) 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 110-120 Volts AC — RATING .62 Amp. @ 117 Volts AC |

**VOLTAGE READINGS**

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SL7GT | 0V. | 120VDC | .4VDC | 0V. | 100VDC | .2VDC | 18.5VDC | 18.5VDC |
| 2 | 6SL7GT | 0V. | 120VDC | .2VDC | 0V. | 120VDC | .2VDC | 18.5VDC | 18.5VDC |
| 3 | 6V6GT | 0V. | 18.5VDC | 340VDC | 300VDC | 0V. | 0V. | 18.5VDC | 18.5VDC |
| 4 | 6V6GT | 0V. | 18.5VDC | 340VDC | 300VDC | 0V. | 0V. | 18.5VDC | 18.5VDC |
| 5 | 5Y3GT | 0V. | 380VDC | 0V. | 340VAC | 0V. | 340VAC | 0V. | 380VDC |

**RESISTANCE READINGS**

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SL7GT | 0Ω | 300KΩ | 4.7KΩ | 50KΩ | 300KΩ | 2.2KΩ | 250Ω | 250Ω |
| 2 | 6SL7GT | 25KΩ | 420KΩ | 4.7KΩ | 500KΩ | 420KΩ | 4.7KΩ | 250Ω | 250Ω |
| 3 | 6V6GT | INF. | 250Ω | 100KΩ | 100KΩ | 520KΩ | INF. | 250Ω | 250Ω |
| 4 | 6V6GT | 0Ω | 250Ω | 100KΩ | 100KΩ | 500KΩ | INF. | 250Ω | 250Ω |
| 5 | 5Y3GT | INF. | 100KΩ | INF. | 56Ω | INF. | 50Ω | INF. | 100KΩ |

**RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS**

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

**HOWARD W. SAMS & CO., INC.** **Indianapolis Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

MASCO MODEL MAP-120N

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| | | MASCO PART No. | STANDARD REPLACEMENT | | |
| 1 | AF Amp. | | 6SL7GT | 8BD | |
| 2 | AF & Phase Inv. | | 6SL7GT | 8BD | |
| 3 | Power Output | | 6V6GT | 7AC | |
| 4 | " " | | 6V6GT | 7AC | |
| 5 | Rectifier | | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | MASCO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 6A | 8 | 450 | | PRSA450/8-8 | EDL8845 | DH-2x8-450 | UT-88 | Filter |
| B | 8 | 450 | | | | | | " |
| 7 | 8 | 450 | | PRS450-8 | BR845 | M-8-450 | UT-8 | " |
| 8A | 8 | 450 | | PRSA450/8-8 | EDL8845 | DH-2x8-450 | UT-88 | Decoupling |
| B | 8 | 450 | | | | | | " |
| 9 | 10 | 50 | | PRS50-10 | BR105 | M-10-50 | TA-510 | Output Cathode Bypass |
| 10 | 10 | 50 | | PRS50-10 | BR105 | M-10-50 | TA-510 | 2nd AF Cathode Bypass |
| 11 | .005 | 600 | | 684-005 | DT6D5 | ST-6-005 | TC-25 | Audio Coup. |
| 12 | .005 | 600 | | 684-005 | DT6D5 | ST-6-005 | TC-25 | " " |
| 13 | .005 | 600 | | 684-005 | DT6D5 | ST-6-005 | TC-25 | " " |
| 14 | .01 | 600 | | 684-01 | DT6S1 | ST-6-01 | TC-11 | Tone Comp. |
| 15 | .001 | 500 | | 684-001 | DT6D1 | ST-6-001 | TC-21 | Audio Coup. |

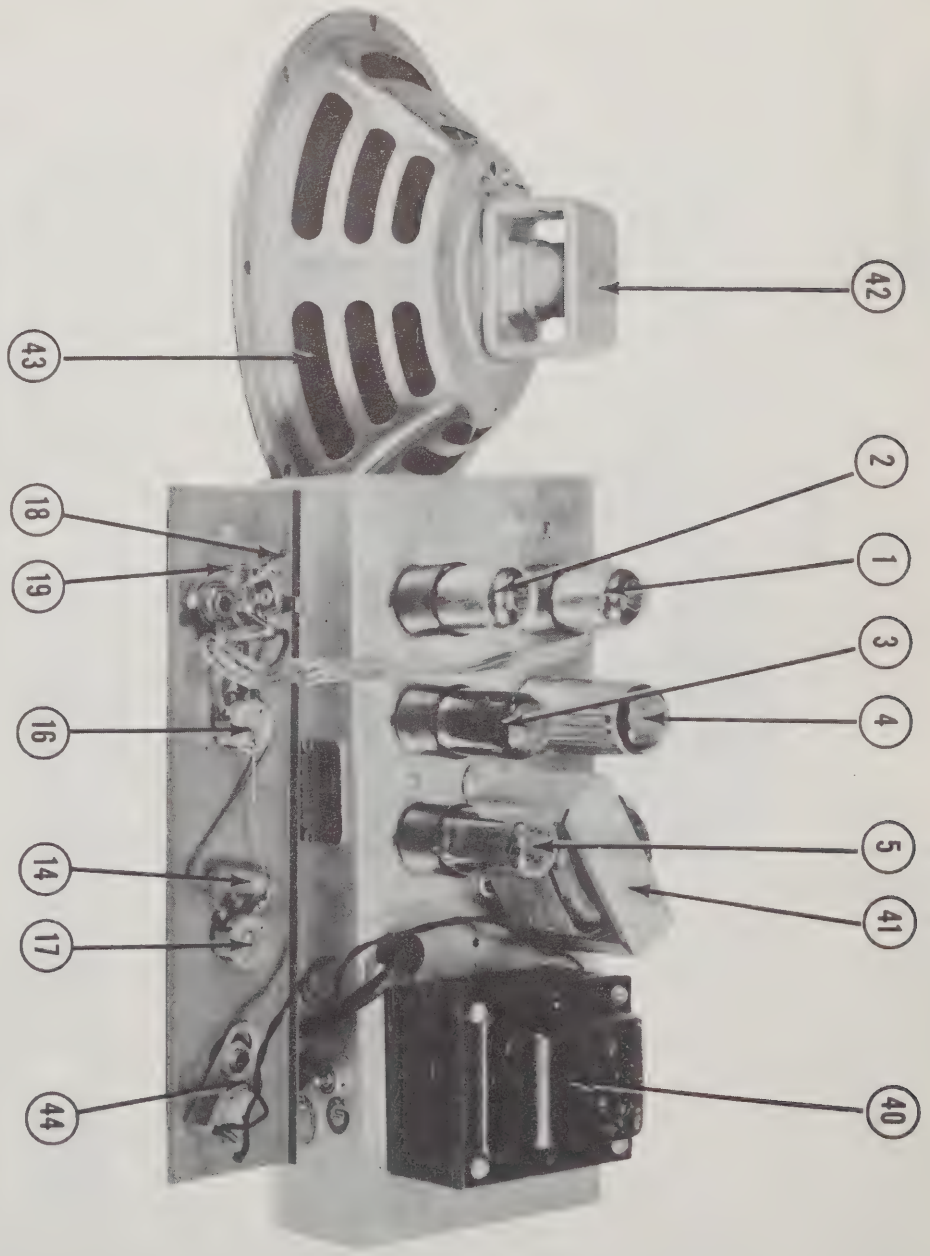
## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MASCO PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 16A | 500KΩ | ½ | | D13-133 | M-60-Z | Volume Control |
| B | Shaft | | | A | Not Req. | Attach to 16A per instructions |
| 17A | 500KΩ | ½ | | D13-133 | M-60-Z | Tone Control |
| B | Shaft | | | A | Not Req. | Attach to 17A per instructions |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MASCO PART No. | IRC PART No. | |
| 18 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. Isolation |
| 19 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. " |
| 20 | 2200Ω | ½ | | BTS-2200 | Red-Red-Red 1st AF Cathode |
| 21 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. 1st AF Plate Load |
| 22 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Vol. Cont. Shunt |
| 23 | 4700Ω | ½ | | BTS-4700 | Yl.-Vi.-Red 2nd AF Cathode |
| 24 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. 2nd AF Plate Load |
| 25 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. 3rd AF Grid |
| 26 | 4700Ω | ½ | | BTS-4700 | Yl.-Vi.-Red 3rd AF Cathode |
| 27 | 270KΩ | ½ | | BTS-270K | Red-Vi.-Yl. 3rd AF Plate Load |
| 28 | 270KΩ | ½ | | BTS-270K | Red-Vi.-Yl. Ph. Inv. Plate Load |
| 29 | 4700Ω | ½ | | BTS-4700 | Yl.-Vi.-Red Ph. Inv. Cathode |
| 30 | 27KΩ | ½ | | BTS-27K | Red-Vi.-Or. Ph. Inv. Grid |
| 31 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 32 | 500KΩ | ½ | | BTS-470K | Grn-Blk.-Yl. Output Grid |
| 33 | 250Ω | 10 | | AB-250 | Output Cathode |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MASCO PART No. | IRC PART No. | |
| 34 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Decoupling |
| 35 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. " |
| 36 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. Filter |
| 37 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. " |
| 38A | 400Ω | 10 | | AB-400 | " -See Note 1 |
| B | 200Ω | 10 | | AB-200 | " " " 2 |
| 39 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Feedback |

Note 1-Used on models using power transformer No. MA-17A.
Note 2-Used on models using power transformer No. A-12D.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | MASCO PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 40A | 117V AC @ .62A | 680V CT @78A DC | 5.2V AC @ 2.0A | 6.9V AC @ 1.8A | MA-17A | P-6014 | T22R05 | A-2953 |
| B | | | | | A-12D | P-6013 | T22R02 | |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | MASCO PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 41 | 10500Ω CT | 6.1Ω | 470Ω CT | .5Ω | 0-128 | A-3824 | T22856 | A-2936‡ | ‡Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | MASCO PART No. | JENSEN PART No. | QUAM PART No. | |
| 42 | FIELD PM | VC IMP. 6.1Ω | | ST-120 Mod. P10-S | 10A4 | |
| 43 | CONE DIA. 9-3/8" | VC DIA. 1" | | | | |

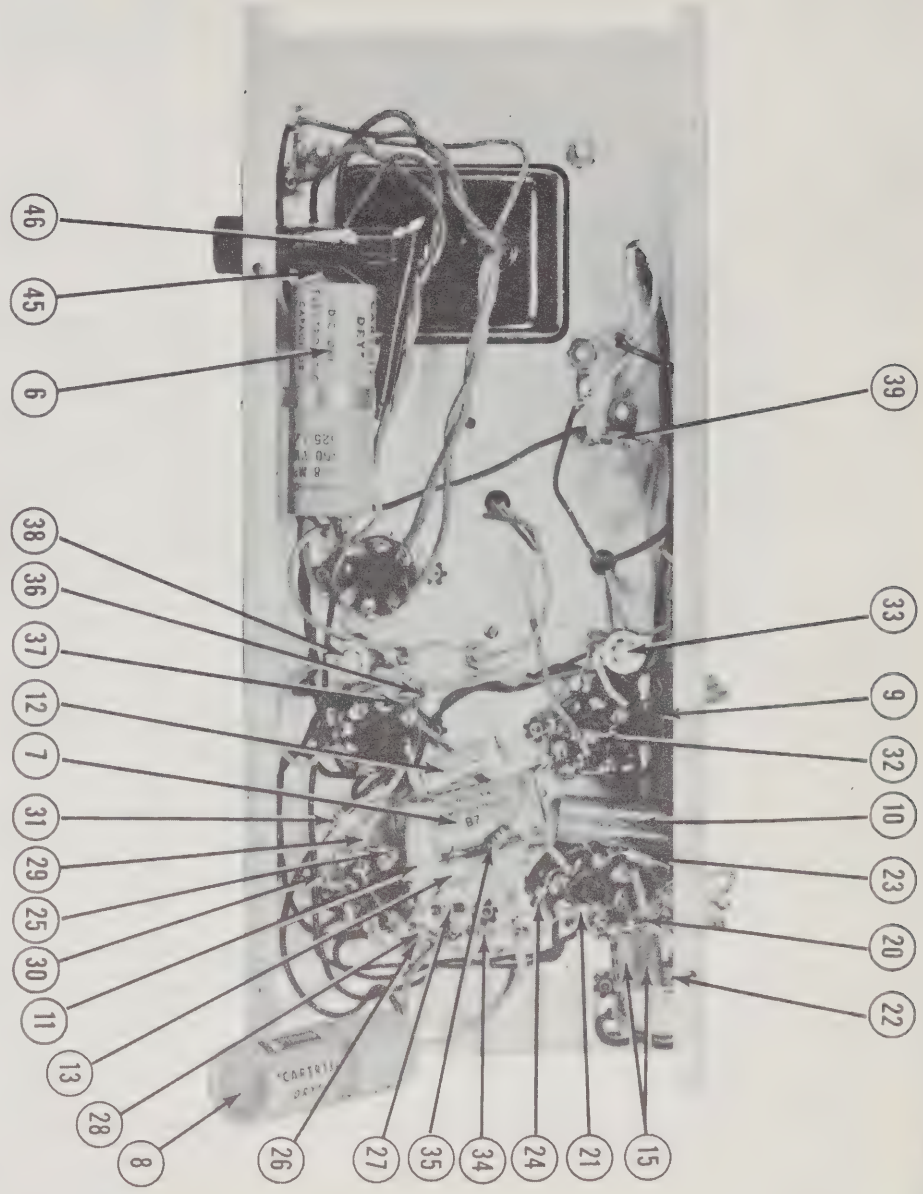
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | MASCO PART No. | | |
| 44 | Bayonet | 6-8 | 0.15 | Brown | | | Type 47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | MASCO PART No. | NOTES |
|---|---|---|---|
| 45 | Switch | | On-Off (SPST) |
| 46 | Fuse | | 3 Amp. |

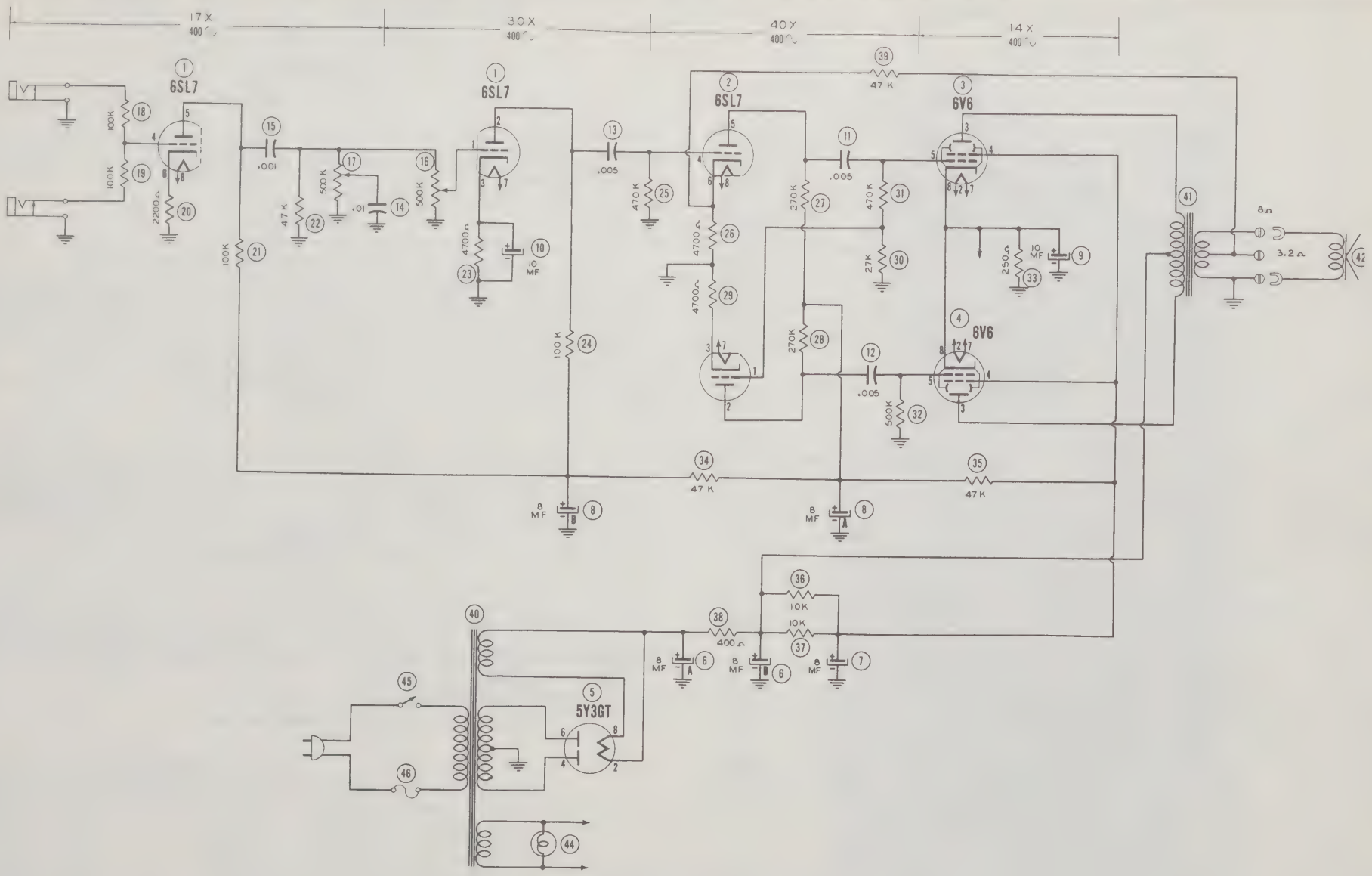
# CHASSIS—BOTTOM VIEW




MASCO MODEL MAP-12ON

DATE 9/48-#4616-15

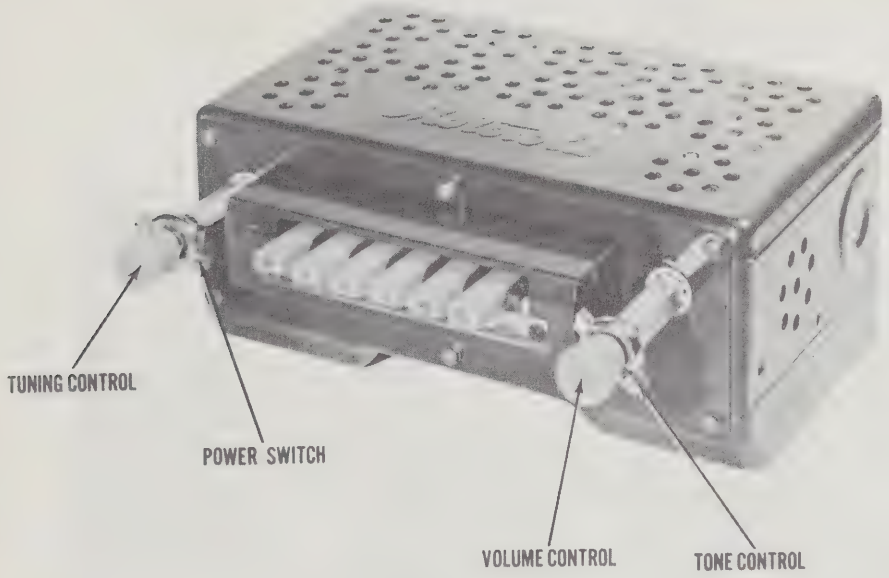
SET #46-FOLDER #15




A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE




MOTOROLA MODEL KR8

| | |
|---|---|
| TRADE NAME | Motorola, Models 8FDT, 8GMT, BK8, BK8X, CT8, FD8, HN8, KR8, NH8, OE2, OE8, PC2, PC8, SR6, SR8 (Chassis 8A) |
| MANUFACTURER | Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill. |
| TYPE SET | Battery Operated Custom-Built Automotive Superheterodyne Receiver |
| TUBES (SIX) | Types, 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 Det.-AVC-AF, 6V6GT Power Output, 6X4 Rectifier. |
| POWER SUPPLY | 6 Volt Storage Battery |
| TUNING RANGE-BROADCAST | 535-1600KC RATING 6.4 Amp. @ 6.2 Volts DC |

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Prior to alignment sensitivity control must be set to provide 2 ± 1/2 volts bias at terminal on control.

To set dial pointer tune receiver to high frequency end and adjust hexagonal head pointer eccentric adjustment screw.

Connect an antenna receptacle plug to one end of 21" coaxial lead. Connect 60 MMFD cap. to other end of coaxial lead. Connect other end of 60 MMFD cap. to high side of signal gen. Connect low side of sig. gen. to chassis and connect ant. plug to chassis ant. receptacle.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to Pin 7 (grid) of 6BE6 Low side to chassis. | 455KC | Tuning cores fully out | Across voice coil | A1,A2, A3,A4 | Adjust for maximum output in order given and repeat. |
| 2 | See prealignment notes. | See prealignment notes. | 1605KC | Tuning cores fully out. (All cores should project 1-1/8" from cans.) | " | A5,A6, A7 | Adjust for maximum output in order given. |
| 3 | " | " | 1425KC | Set spacing between carriage plate and coil shield plate at 1-3/8". | " | A8,A9, A10 | " |
| 4 | " | " | Gen. power off. | Set spacing between carriage plate and coil shield plate at 17/32". | " | All | Adjust for maximum noise. If All must be moved more than 1/2 turn repeat Steps 2, 3 & 4. Reinstall receiver in car. |

With receiver installed in car and antenna fully extended, tune in weak station near 1400KC. Adjust A7 for maximum volume.

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-16 SET #46-FOLDER #16

# PARTS LIST AND DESCRIPTIONS

MOTOROLA CHASSIS 8A

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6BA6 | 6BA6 | 7BK | |
| 2 | Converter | 6BE6 | 6BE6 | 7CH | |
| 3 | IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 4 | Det.-AVC-AF | 6AT6 | 6AT6 | 7BT | |
| 5 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 6 | Rectifier | 6X4 | 6X4 | 5BS | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 7A | 30 | 300 | 23A473015 | | UP2235C | DY-312# | EL-323# | ■ Filter |
| B | 30 | 300 | | | | M-2x10-450# | UT-123 | ▲ " |
| C | 20 | 25 | | | | | | Cathode Bypass |
| 8 | .006 | 1600 | 8A12840 | 2089.-006 | MD16D6 | XTT15-006 | TR-26 | Buffer |
| 9 | .5 | 100 | 8A17023 | | DT2P5 | SHH-1 | | Hash Filter |
| 10 | .5 | 100 | 8A17028 | | | SHH-1 | | " " |
| 11 | .006 | 400 | 8A71910 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Output Plate Bypass |
| 12 | .03 | 400 | 8A71911 | 484-03 | DT4S3 | ST-6-03 | TC-13 | Audio Coupling |
| 13 | .05 | 100 | 8A13514 | 484-05 | DT2S5 | ST-4-05 | TC-15 | " " |
| 14 | .01 | 100 | 8A472754 | 484-01 | DT2S1 | ST-4-01 | TC-11 | Tone Comp. |
| 15 | .006 | 400 | 8A71910 | 484-006 | DT6D6 | ST-6-006 | TC-26 | " " |
| 16 | .05 | 400 | 8A14791 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Screen Bypass |
| 17 | .1 | 400 | 8K13166 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | Decoupling |
| 18 | .05 | 100 | 8A13514 | 484-05 | DT2S5 | ST-4-05 | TC-15 | Sens. Control Bypass |
| 19 | .05 | 100 | 8A13514 | 484-05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 20 | .006 | 100 | 8A4529 | 484-006 | DT6D6 | ST-6-006 | TC-26 | Ant. Coupling |
| 21 | 50 | 300 | 21K74661 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | AVC Coupling-Cer. |
| 22A | 100 | 300 | * | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Diode RF Filter |
| B | 100 | 300 | * | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | " " " |
| 23 | 500 | 500 | 21R6639 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | AF Plate Bypass |
| 24 | 50 | 300 | 21K74661 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap.-Cer. |
| 25 | 400 | 500 | 21A71872 | 1469-0004 | 5R5T4 | MOS.5-34 | MS-34 | Fixed Trimmer 5%-Cer. |
| 26 | 5 | 500 | 21K70720 | 1468-000005 | 5W5V5 | MO.5-55 | MS-55 | RF Coupling-Cer. |
| 27 | 100 | 500 | 21B77562 | 1468-0001 | 5W5T1 | MO.5-31 | MS-31 | Fixed Trimmer-Cer. |

*Items #22A, 22B and #36 are combined in one unit and may be obtained under Part #21A472571.
#Parallel sections to obtain desired capacity.

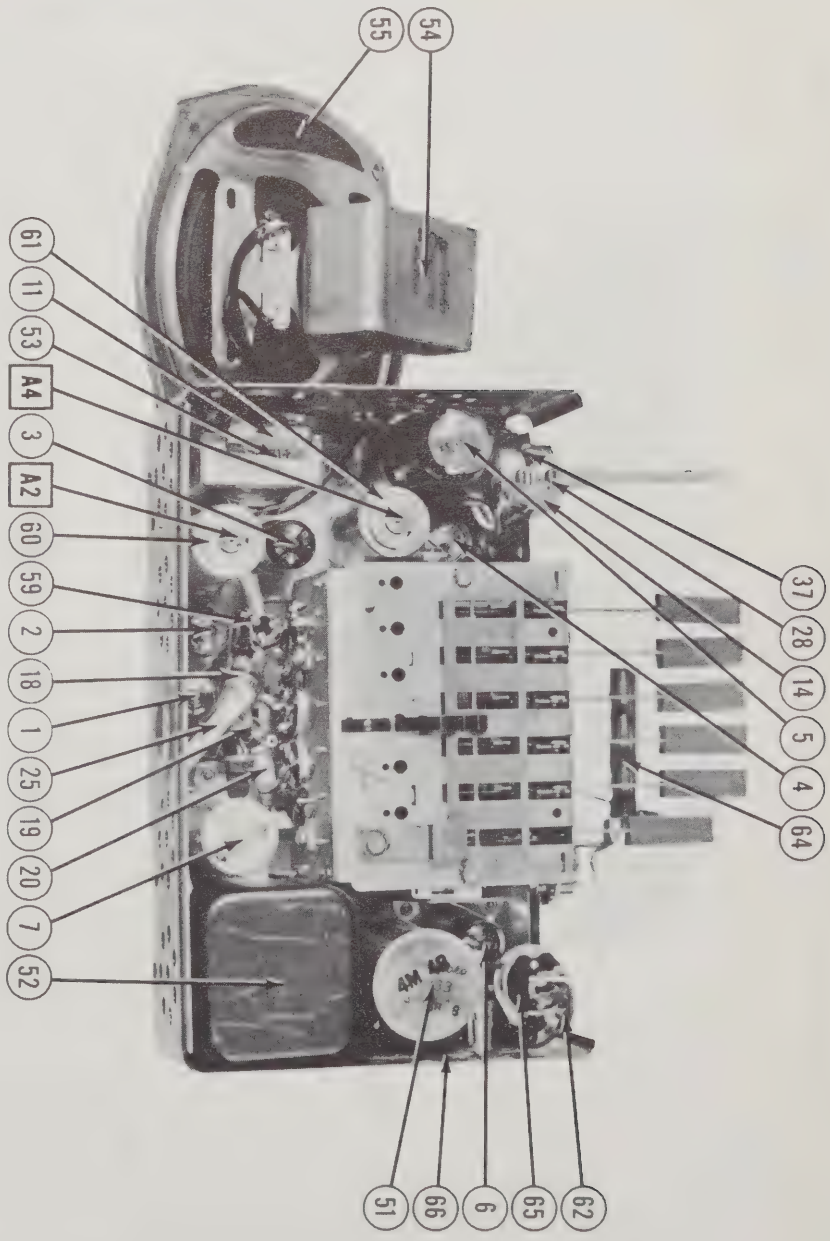
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MOTOROLA PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 28A | 500KΩ | ½ | 1cA472863 | | | Volume Control tapped @ 50KΩ |
| B | 500KΩ | ½ | | | | Tone Control |
| 29 | 700Ω | | 18K77552 | | | Sensitivity Control |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MOTOROLA PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 30 | 150Ω | ½ | 6R3002 | BW-½-150 | Br.-Grn.-Br. RF Cathode |
| 31 | 470KΩ | ½ | 6R6032 | BTS-470K | Yl.-Vi.-Yl. RF Grid |
| 32 | 100KΩ | ½ | 6R6075 | BTS-100K | Br.-Blk.-Yl. Conv. Grid |
| 33 | 47KΩ | ½ | 6R6056 | BTS-47K | Yl.-Vi.-Or. Osc. Grid |
| 34 | 10KΩ | 2 | 6R476060 | BT-2-10K | Br.-Blk.-Or. Screen Dropping |
| 35 | 68KΩ | ½ | 6R6001 | BTS-68K | Blue-Gray-Or. Bias Network |
| 36 | 47KΩ | ½ | * | BTS-47K | Yl.-Vi.-Or. Diode Filter |
| 37 | 22KΩ | ½ | 6R6028 | BTS-22K | Red-Red-Or. Tone Comp. |
| 38 | 3.3 Meg. | ½ | 6R2118 | BTS-3.3 Meg. | Or.-Or.-Grn. AF Grid |
| 39 | 1500Ω | ½ | 6R1161 | BTS-150C | Br.-Grn.-Red AF Cathode |
| 40 | 470KΩ | ½ | 6R6032 | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 41 | 220KΩ | ½ | 6R6056 | BTS-220K | Red-Red-Yl. Output Grid |
| 42 | 270Ω | 1 | 6R6336 | BW-1-270 | Red-Vi.-Br. Output Cathode |
| 43 | 1 Meg. | ½ | 6R6004 | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 44 | 1 Meg. | ½ | 6R6004 | BTS-1 Meg. | Br.-Blk.-Grn. " " |
| 45 | 330Ω | ½ | 6R6016 | BW-½-330 | Or.-Or.-Br. Decoupling |
| 46 | 1000Ω | 2 | 6R476004 | BT-2-1000 | Br.-Blk.-Red Filter |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MOTOROLA PART No. | IRC PART No. | |
| 47 | 10KΩ | ½ | 6R6054 | BTS-10K | Br.-Blk.-Or. Hash Suppressor |
| 48 | 56Ω | ½ | 6R5614 | BW-½-56 | Grn.-Blue-Blk. " " |
| 49 | 56Ω | ½ | 6R5614 | BW-½-56 | Grn.-Blue-Blk. " " |
| 50 | 150Ω | ½ | 6R3992 | BW-½-150 | Br.-Grn.-Br. IF Cathode |

*Items #22A, 22B & 36 combined in one unit and may be obtained under Part #21A472571.

## VIBRATOR

| ITEM No. | TYPE | INPUT VOLTS | FREQUENCY | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | | MOTOROLA PART No. | RADIART PART No. | |
| 51 | Interrupter | 6.3 | 115 ∿ | 48B3333 | 5342M | |

## TRANSFORMER (VIBRATOR)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | MOTOROLA PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 52 | 5.7VDC @ 4.1A | 540V CT .062A DC | | | 25B472533 | | | |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | MOTOROLA PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 53 | 8KΩ | 3.2Ω | 365Ω | .6Ω | 25B70171 | A-3879 | T22S47 | A-2931 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | MOTOROLA PART No. | JENSEN PART No. | QUAM PART No. | |
| 54 | FIELD | VC IMP. | 50B473783 | ST-110 Mod. P6-V | 6A21 | |
| | PM | 3.2Ω | | | | |
| 55 | CONE DIA. 6" | VC DIA. 9/16" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | MOTOROLA PART No. | MEISSNER PART No. | |
| 56 | Ant. Coil | | 11Ω | 24B71881 | | Items 56, 57 & 58 are ganged together and slug tuned. They are part of complete assembly which may be obtained under Part #1X472770. |
| 57 | RF Coil | | 11Ω | 24B71881 | | |
| 58 | Osc. Coil | | 2.8Ω | 24B71879 | | |
| 59 | Osc. Shunt Coil | | 2.8Ω | 24B70227 | | |
| 60 | Input IF | | 20Ω | 24B76553 | 16-6668 | |
| 61 | Output IF | | 20Ω | 24B76553 | 16-6669 | |
| 62 | Choke | | 0Ω | 24K78026 | | |
| 63 | Hash Choke | | 0Ω | 24A472535 | | |

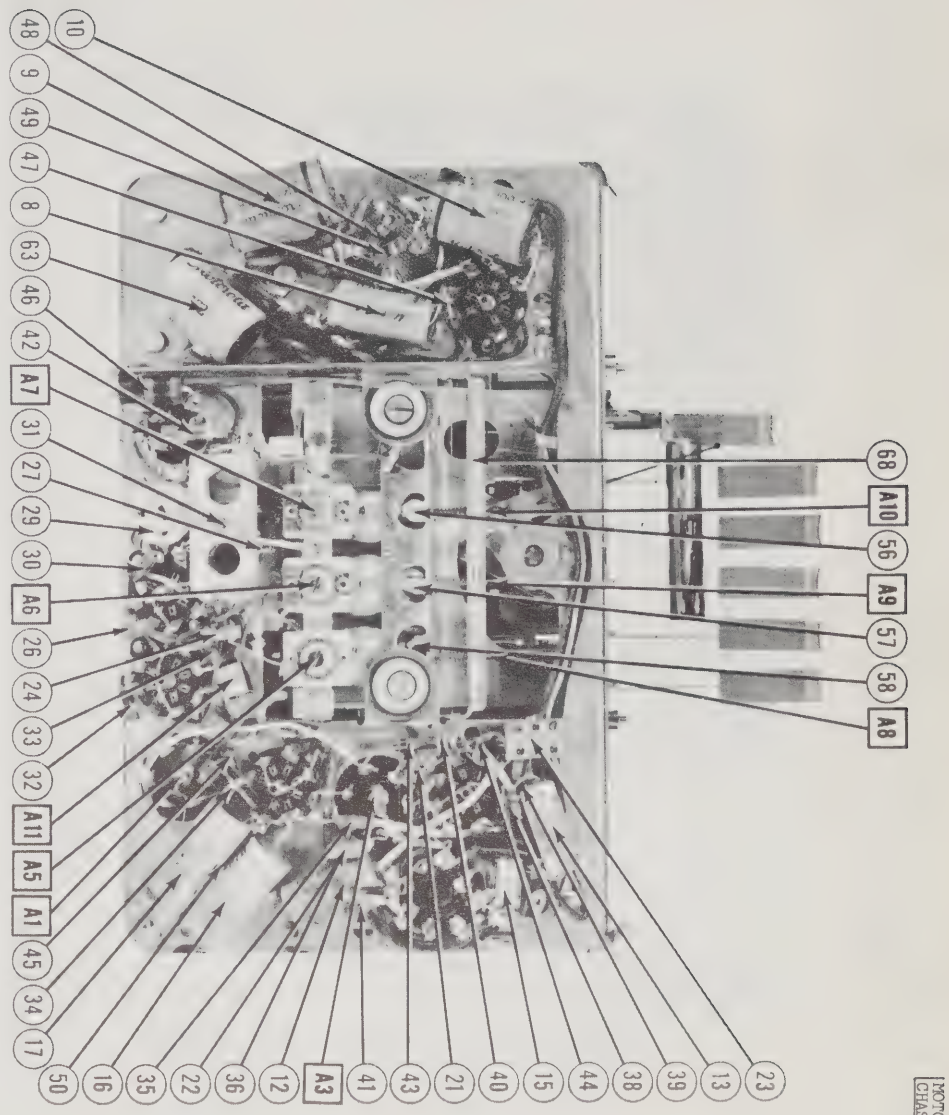
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | MOTOROLA PART No. | | |
| 64 | Bayonet | 6-8 | 0.25 | Blue | | | Type 44 |

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| 65 | Switch | 1A472891 | On-Off |
| 66A | Spark Plate | 1A472606 | |
| B | " " | | |
| 67 | Fuse | 65A10266 | 10 Amp. (3AG) |
| 68 | Tuning Assembly | 1X472270 | |
| A5 | Trimmer Strip | 20A480600 | Osc. Adj. |
| A6 | | | RF Adj. |
| A7 | | | Ant. Adj. |

# CHASSIS—BOTTOM VIEW

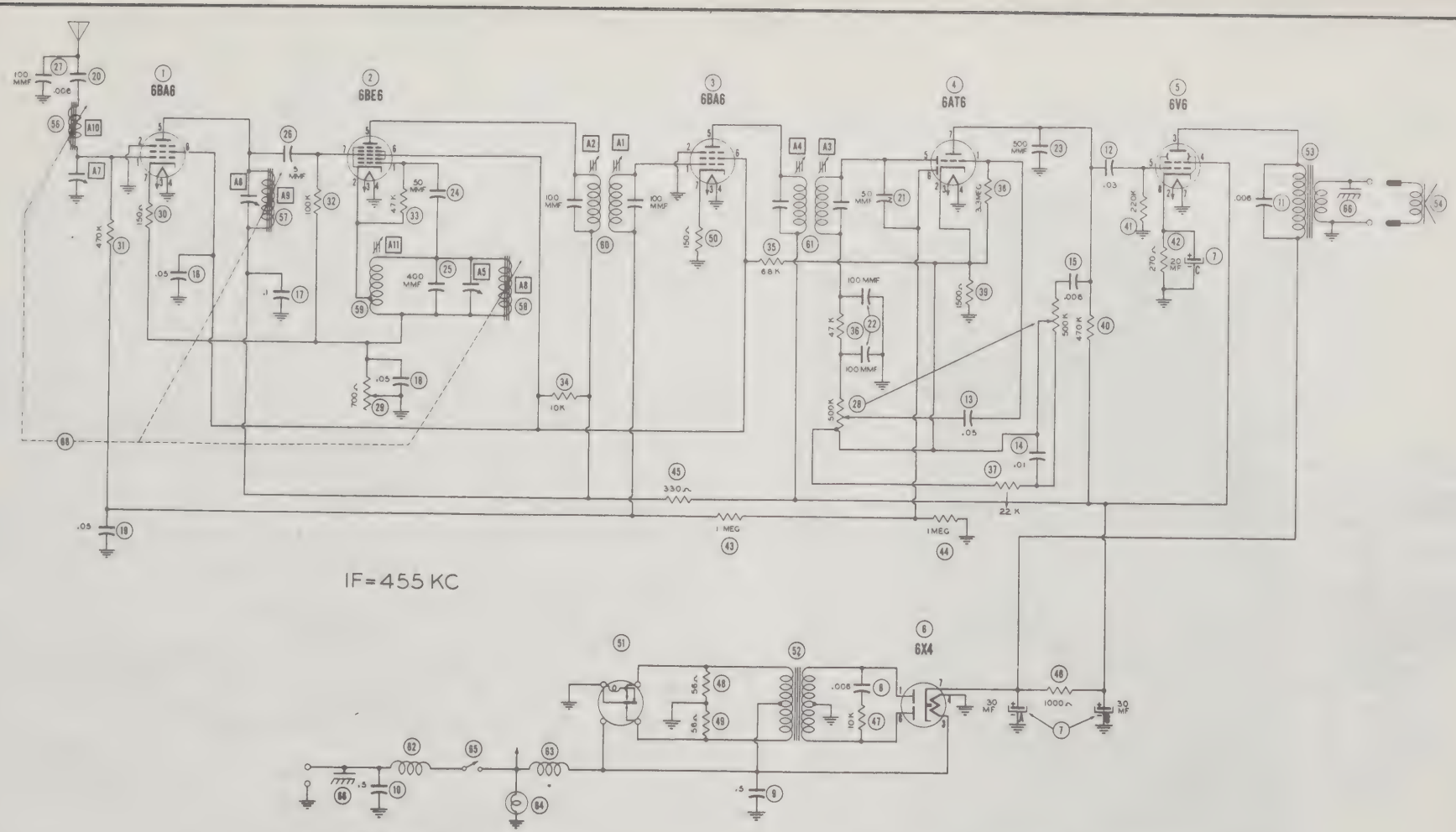



MOTOROLA CHASSIS 8A

DATE 9/48-#4816-16

SET #46-FOLDER #16

MOTOROLA CHASSIS 8A




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BA6 | 0V. | 0V. | 6.2VDC | 0V. | 195VDC | 90VDC | 3.4VDC | - |
| 2 | 6BE6 | -5.5VDC | 2.8VDC | 6.2VDC | 0V. | 165VDC | 90VDC | 0V. | - |
| 3 | 6BA6 | 0V. | 0V. | 6.2VDC | 0V. | 195VDC | 90VDC | 1.2VDC | - |
| 4 | 6AT6 | .2VDC | 2.8VDC | 6.2VDC | 0V. | .6VDC | 0V. | 55VDC | - |
| 5 | 6V6GT | .8VDC | 6.2VDC | 215VDC | 200VDC | 0V. | 0V. | 0V. | 3.8VDC |
| 6 | 6X4 | 270VAC | 260VAC | 6.2VDC | 0V. | 6.2VDC | 0V. | 270VAC | 230VDC |

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BA6 | 2.5 Meg. | 0Ω | .1Ω | 0Ω | 50KΩ | 50KΩ | 70Ω | - |
| 2 | 6BE6 | 47KΩ | 700Ω | .1Ω | 0Ω | 5MΩ | 50KΩ | 2.1 MΩ | - |
| 3 | 6BA6 | 2 Meg. | 0Ω | .1Ω | 0Ω | 5MΩ | 50KΩ | 140Ω | - |
| 4 | 6AT6 | 3.3 MEG. | 1.5KΩ | .1Ω | 0Ω | 500K | 1 Meg. | 820KΩ | - |
| 5 | 6V6GT | .1Ω | .1Ω | 80KΩ | 5KΩ | 10 K | INF. | ∞ | ∞ |
| 6 | 6X4 | 400Ω | 10KΩ | .1Ω | 0Ω | 10KΩ | 47KΩ | 47KΩ | - |

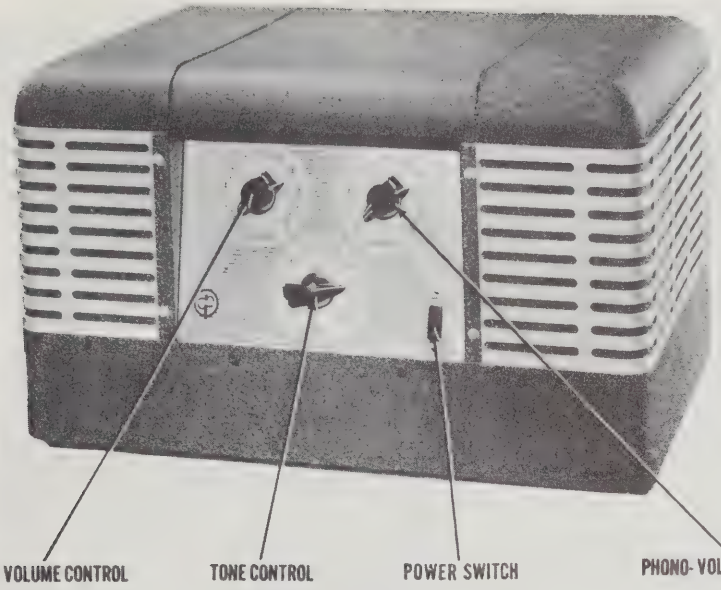
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1948

4816-16

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.




OPERADIO MODEL 1A140

| | |
|---|---|
| TRADE NAME | Operadio, Model 1A140 |
| MANUFACTURER | Operadio Mfg. Co., St. Charles, Ill. |
| TYPE SET | AC Operated Audio Amplifier |
| TUBES (SIX) | Types, 6J7 Mic. Amp., 6J7 AF Amp., 6SL7GT AF-Phase Inv., (2) 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 110-120 Volts AC RATING .68 Amp. @ 117 Volts AC |

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6J7 | 0V. | 3.2VAC | 80VDC | 25VDC | 0V. | 240VDC | 3.2VAC | 0V. | -.4VDC |
| 2 | 6J7 | 0V. | 3.2VAC | 55VDC | 55VDC | 55VDC | 2VDC | 3.2VAC | 2VDC | 0V. |
| 3 | 6SL7GT | 0V. | 130VDC | 1VDC | 0V. | 140VDC | 1.4VDC | 3.2VAC | 3.2VAC | - |
| 4 | 6V6GT | 0V. | 3.2VAC | 340VDC | 345VDC | 0V. | 0V. | 3.2VAC | 23VDC | - |
| 5 | 6V6GT | 0V. | 3.2VAC | 340VDC | 345VDC | 0V. | 0V. | 3.2VAC | 23VDC | - |
| 6 | 5Y3GT | 0V. | 360VDC | 0V. | 340VAC | 0V. | 340VAC | 0V. | 360VDC | - |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6J7 | 0Ω | .05Ω | 480KΩ | 1.7 Meg. | 0Ω | 190KΩ | .05Ω | 0Ω | 10 Meg. |
| 2 | 6J7 | 0Ω | .05Ω | 420KΩ | 420KΩ | 420KΩ | 2.7KΩ | .05Ω | 2.7KΩ | 470KΩ |
| 3 | 6SL7GT | 470KΩ | 240KΩ | 650Ω | 10KΩ | 240KΩ | 1KΩ | .05Ω | .05Ω | - |
| 4 | 6V6GT | 0Ω | .05Ω | 130KΩ | 130KΩ | 280KΩ | INF. | .05Ω | 250Ω | - |
| 5 | 6V6GT | 0Ω | .05Ω | 130KΩ | 130KΩ | 270KΩ | INF. | .05Ω | 250Ω | - |
| 6 | 5Y3GT | INF. | 130KΩ | INF. | 85Ω | INF. | 90Ω | INF. | 130KΩ | - |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

OPERADIO MODEL 1A140

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: OPERADIO PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | Mic. Amp. | 6J7 | 6J7 | 7R | |
| 2 | AF Amp. | 6J7 | 6J7 | 7R | |
| 3 | AF-Phase Inv. | 6SL7GT | 6SL7GT | 8BD | |
| 4 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 5 | " " | 6V6GT | 6V6GT | 7AC | |
| 6 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: OPERADIO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 7A | 20 | 500 | 199-2914 | AF44J | UP2250 | DY-4x10-450* | EL-220 | ▲ Filter |
| B | 20 | 500 | | | | | | ▲ " |
| 8A | 10 | 400 | 199-2904 | AF222J* | UP6CJ20 | DY-3x10-450* | EL-360 | ▲ Decoupling |
| B | 20 | 450 | | PRS350/4 | | M-4-450 | | ■ " |
| C | 5 | 350 | | | | | | " |
| 9 | 25 | 25 | | PRS25/25 | BR252A | M-25-25 | TA-25 | Output Cathode Bypass |
| 10 | 20 | 25 | 199-2001-206 | PRS25/25 | BR202A | M-25-25 | TA-25 | AF Cathode Bypass |
| 11 | .006 | 600 | 199-4030-602 | 684-006 | DT6D6 | ST-6-006 | TC-26 | Line Filter |
| 12 | .1 | 400 | 199-4021-104 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | Audio Coupling |
| 13 | .1 | 400 | 199-4021-104 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | " " |
| 14 | .1 | 400 | 199-4021-104 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | " " |
| 15 | .01 | 400 | 199-4020-103 | 484-01 | DT4S1 | ST-4-01 | TC-11 | " " |
| 16 | .01 | 400 | 199-4020-103 | 484-01 | DT4S1 | ST-4-01 | TC-11 | AF Screen Bypass |
| 17 | .0005 | 600 | 199-4030-501 | 1468-0005 | DT6T5 | ST-6-005 | TC-35 | Tone Comp. |
| 18 | .002 | 600 | 199-4030-202 | 684-002 | DT6D2 | ST-6-002 | TC-22 | " " |
| 19 | .006 | 600 | 199-4030-602 | 684-006 | DT6D6 | ST-6-006 | TC-26 | Mic. Coupling |

*Parallel sections to obtain desired capacity.

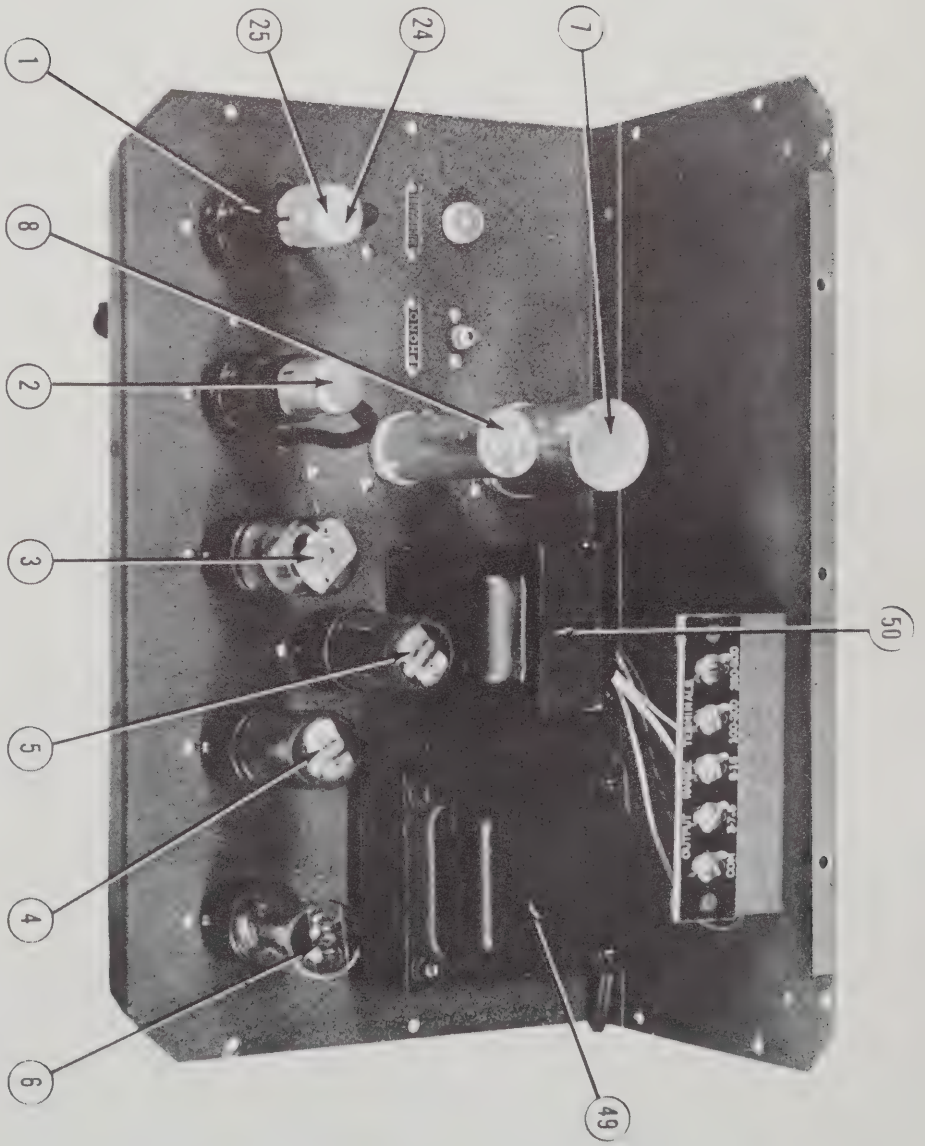
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: OPERADIO PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 20A | 2.5 Meg | ½ | 601-3589 | D13-140 | M-66-Z | Mike Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 20A per instructions |
| 21A | 2.5 Meg | ½ | 601-3589 | D13-140 | M-66-Z | Phono Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 21A per instructions |
| 22A | 2.5 Meg. | ½ | 601-3589 | D13-140 | M-66-Z | Tone Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 22A per instructions |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: OPERADIC PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 23 | 470KΩ | 1 | 600-0116-474 | BTA-470K | Yl.-Vi.-Yl. Phono Isolation |
| 24 | 10 Meg. | ½ | 600-0043-106 | BTS-10 Meg. | br.-blk.-blue Mic. Amp. Grid |
| 25 | 68KΩ | ½ | 600-0043-683 | BTS-68K | blue-Gray-Or. Mic. Amp. Grid |
| 26 | 1.5 Meg. | 1 | 600-0116-155 | BTA-1.5 Meg. | Br.-Grn.-Grn. Mic. Amp. Screen |
| 27 | 270KΩ | ½ | 600-0116-274 | BTA-270K | Red-Vi.-Yl. Mic. Amp. Plate Load |
| 28 | 470KΩ | ½ | 600-0116-474 | BTA-470K | Yl.-Vi.-Yl. Isolation |
| 29 | 470KΩ | ½ | 600-0116-474 | BTA-470K | Yl.-Vi.-Yl. Tone Comp. |
| 30 | 270KΩ | ½ | 600-0116-274 | BTA-270K | Red-Vi.-Yl. " " |
| 31 | 470KΩ | ½ | 600-0116-474 | BTA-470K | Yl.-Vi.-Yl. 1st AF Grid |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | OPERADIO PART No. | IRC PART No. | |
| 32 | 2700Ω | ‡ | 600-0116-272 | BTA-2700 | Red-Vi.-Red 1st AF Cathode |
| 33 | 270KΩ | ‡ | 600-0116-274 | BTA-270K | Red-Vi.-Yl. 1st AF Plate Load |
| 34 | 470KΩ | ‡ | 600-0116-474 | BTA-470K | Yl.-Vi.-Yl. 2nd AF Grid |
| 35 | 560Ω | ‡ | 600-0116-561 | BTA-560 | Grn.-Blue-Br. 2nd AF Cathode |
| 36 | 100KΩ | ‡ | 600-0116-104 | BTA-100K | Br.-Blk.-Yl. 2nd AF Plate Load |
| 37 | 100KΩ | ‡ | 600-0116-104 | BTA-100K | Br.-Blk.-Yl. Phase Inv. Plate Load |
| 38 | 1000Ω | ‡ | 600-0116-102 | BTA-1000 | Br.-Blk.-Red Ph. Inv. Cathode |
| 39 | 10KΩ | ‡ | 600-0116-103 | BTA-10K | Br.-Blk.-Or. Ph. Inv. Grid |
| 40 | 10KΩ | ‡ | 600-0116-103 | BTA-10K | Br.-Blk.-Or. Decoupling |
| 41 | 47KΩ | ‡ | 600-0116-473 | BTA-47K | Yl.-Vi.-Or. " |
| 42 | 10KΩ | ‡ | 600-0116-103 | BTA-10K | Br.-Blk.-Or. " |
| 43 | 270KΩ | ‡ | 600-0116-274 | BTA-270K | Red-Vi.-Yl. Output Grid |
| 44 | 270KΩ | 1 | 600-0116-274 | BTA-270K | Red-Vi.-Yl. " " |
| 45 | 250Ω | 5 | 600-1008-251 | AB-250 | Output Cathode Filter |
| 46 | 500Ω | 5 | 600-1008-501 | AB-500 | |
| 47 | 82Ω | 1 | 600-0116-820 | BW-1-82 | Gray-Red-Blk. Feedback |
| 48 | 2700Ω | 1 | 600-0116-272 | BTA-2700 | Red-Vi.-Red " |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | OPERADIO PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 49 | 117V AC @ .66A | 680V CT .09A DC | 5.2V AC @ 2.0A | 6.4V CT @ 1.9A | 710-4041 | P-6013 | T22R05 | P-2053 |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | OPERADIO PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 50 | 10KΩ CT | 3-7.5<br>8-16<br>100-200<br>250-500 | 400Ω CT | .4Ω<br>.9Ω<br>17Ω<br>23Ω | 710-2017 | A-3311‡ | T22864‡ | A-3128‡ | ‡Drill new mounting holes. |

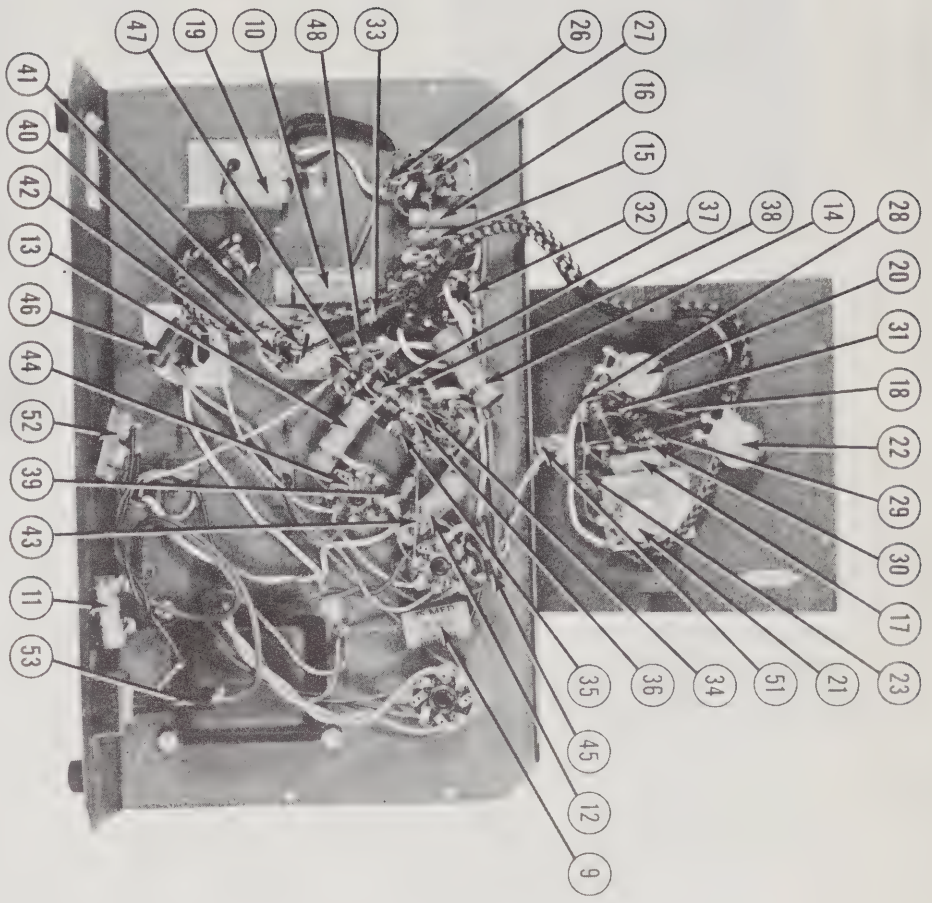
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | OPERADIO PART No. | | |
| 51 | Bayonet | 6-8 | 0.25 | Blue | 450-3496 | | Type 44 |

## MISCELLANEOUS

| ITEM No. | PART NAME | OPERADIO PART No. | NOTES |
|---|---|---|---|
| 52 | Switch | 680-30 | On-Off (SPST) |
| 53 | Fuse<br>Holder | 320-835-0200<br>440-17 | 2-Amp. (3AG) |

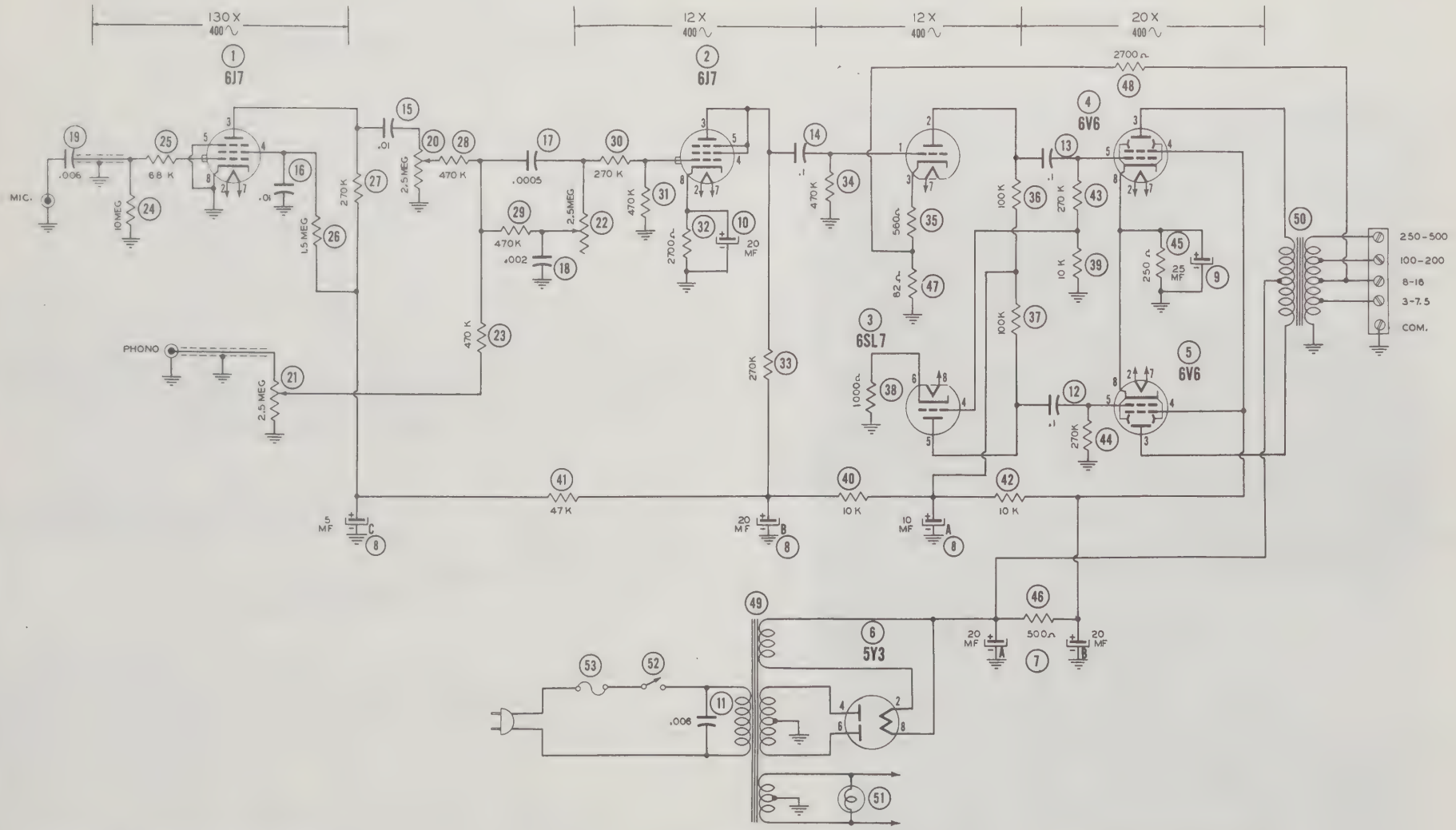
# CHASSIS—BOTTOM VIEW








OPERADIO MODEL 1A140

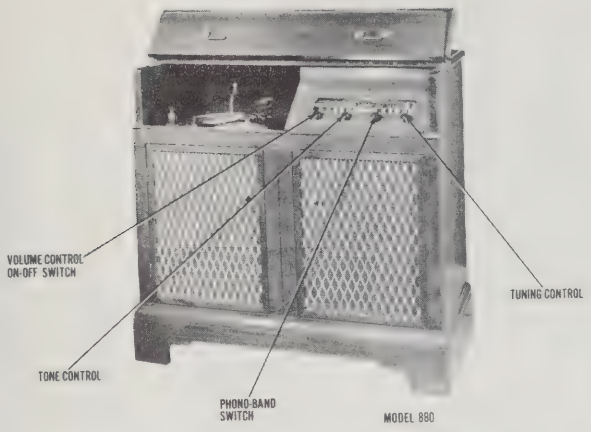


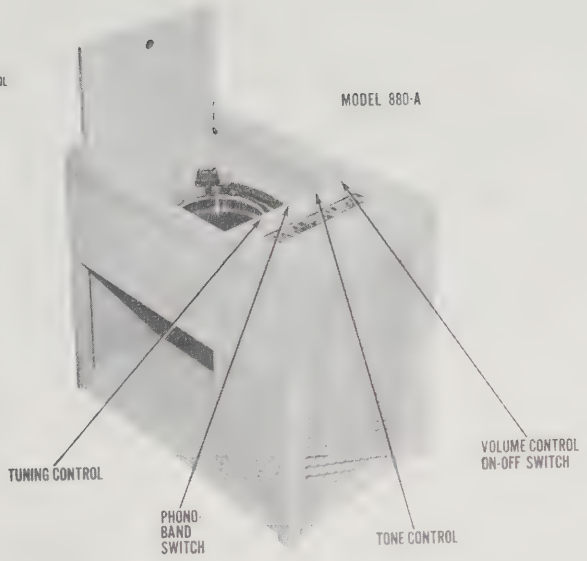

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

4816-17




PACKARD-BELL MODELS
673A, 673B, 880, 880A

PACKARD-BELL MODELS
673A, 673B, 880, 880A

| | |
|---|---|
| TRADE NAME | Packard-Bell, Models 673A, 673B, 880, 880A |
| MANUFACTURER | Packard-Bell Co., 3443 Wilshire Blvd., Los Angeles, Calif. |
| TYPE SET | AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna |
| TUBES (EIGHT) | Types, 6SK7 RF Amp., 6SA7 Mixer, 6J5 Oscillator, 6SK7 IF Amp., 6J5 Det.-AVC, 6SK7 AF Amp., 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 110-120 Volts AC |
| TUNING RANGE—BROADCAST | 540-1620KC RATING .45 Amp. @ 117 Volts AC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

Volume control at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .01 MFD. | High side to Pin 8 (grid) of 6SA7. Low side to chassis. | 455KC | Tuning cap. fully closed. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. Reinstall receiver in cabinet. |
| 2 | | Loop | 1620KC | Tuning cap. fully open. | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3 | | " | 600KC | Tune for maximum output. | " | A6 | Rock tuning cap. and adjust for maximum output. |
| 4 | | " | 1500KC | " | " | A7,A8 | Adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made. |

DISASSEMBLY NOTE: To remove Model 880 chassis from cabinet, remove one machine screw located at front of record changer compartment. Remove two machine screws located at rear of chassis. Remove chassis from cabinet.

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-18 SET #46-FOLDER #18

# PARTS LIST AND DESCRIPTIONS

PACKARD-BELL MODELS
[illegible]

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6SK7 | 6SK7 | 8N | |
| 2 | Mixer | 6SA7 | 6SA7 | 8R | |
| 3 | Oscillator | 6J5 | 6J5 | 6Q | |
| 4 | IF Amp. | 6SK7 | 6SK7 | 8N | |
| 5 | Det.-AVC | 6J5 | 6J5 | 6Q | |
| 6 | AF Amp. | 6SK7 | 6SK7 | 8N | |
| 7 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 8 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: PACKARD-BELL PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 9 | 20 | 350 | 24003 | PRS450/20 | BR2045 | M-20-350 | UT-203 | Filter |
| 10 | 20 | 350 | | PRS450/20 | BR2045 | M-20-350 | UT-203 | " |
| 11 | .005 | 600 | 23004 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Output Plate Bypass |
| 12 | .02 | 600 | 23007 | 684-02 | DT6S2 | ST-6-02 | TC-12 | Audio Coupling |
| 13 | .001 | 600 | 23001 | 684-001 | DT6D1 | ST-6-001 | TC-21 | Tone Comp. |
| 14 | .2 | 400 | 23020 | 484-.2 | DT4P2 | ST-4-2 | TC-2 | AF Screen Bypass |
| 15 | .005 | 600 | 23004 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Audio Comp. |
| 16 | .1 | 400 | 23011 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | AF Screen Decoup. |
| 17 | .05 | 400 | 23009 | 484-05 | DT4S5 | ST-4-05 | TC-15 | RF Bypass Power Supply |
| 18 | .05 | 400 | 23009 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Decoupling |
| 19 | .05 | 400 | 23009 | 484-05 | DT4S5 | ST-4-05 | TC-15 | AVC Filter |
| 20 | 220 | 300 | 23015 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | AF Plate Bypass-Cer. |
| 21A | 150 | 300 | * | 1468-00015 | 5W5T15 | MO.5-315 | 1FM-315 | Diode RF Filter-Cer. |
| B | 150 | 300 | * | 1468-00015 | 5W5T15 | MO.5-315 | 1FM-315 | " " " " |
| 22 | 47 | 300 | 23012 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap.-Cer. |
| 23 | 47 | 300 | 23012 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Fixed Trimmer-Cer. |
| 24 | 220 | 500 | 23015 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | RF Coupling-Cer. |
| 25 | 220 | 500 | 23015 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | " " " |

*Item 21A, 21B and 35 are combined in one unit.

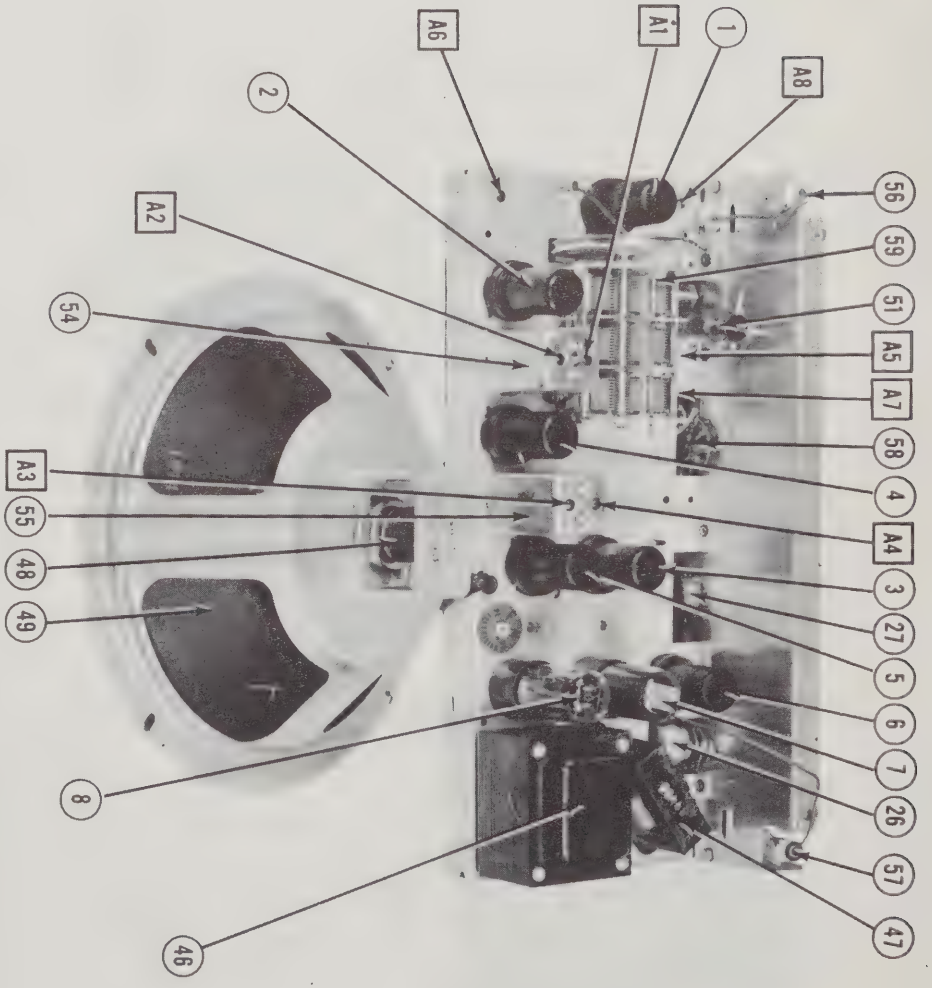
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: PACKARD-BELL PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 26A | 1 Meg. | ½ | 25010B | D13-137X | T-109 | Volume Control tapped @ 200KΩ |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 26A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |
| 27A | 5 Meg. | ½ | 25506C | D11-141 | M-69-Z | Tone Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 27A per instructions |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: PACKARD-BELL PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 28 | 2.2 Meg. | ½ | 73055 | BTS-2.2 Meg. | Red-Red-Grn. RF Grid |
| 29 | 39Ω | ½ | 73008 | BW-½-39 | Or.-White-Blk. RF Cathode |
| 30 | 2.2 Meg. | ½ | 73055 | BTS-2.2 Meg. | Red-Red-Grn. Mixer Grid |
| 31 | 330Ω | ½ | | BW-½-330 | Or.-Blk.-Br. Mixer Cathode |
| 32 | 22KΩ | ½ | 73041 | BTS-22K | Red-Red-Or. Osc. Grid |
| 33 | 1 Meg. | ½ | 73053 | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 34 | 390Ω | ½ | 73020 | BW-½-390 | Or.-White-Br. IF Cathode |
| 35 | 47KΩ | ½ | * | BTS-47K | Diode Filter-See Note |
| 36 | 10KΩ | 2 | 73125 | BT-2-10K | Br.-Blk.-Or. Voltage Dropping |
| 37 | 4.7 Meg. | ½ | 73057 | BTS-4.7 Meg. | Yl.-Vi.-Grn. AF Grid |
| 38 | 47KΩ | ½ | 73045 | BTS-47K | Yl.-Vi.-Or. AF Screen |
| 39 | 39Ω | ½ | 73008 | BW-½-39 | Or.-White-Blk. AF Cathode |
| 40 | 1 Meg. | ½ | 73053 | BTS-1 Meg. | Br.-Blk.-Grn. AF Screen Decoupling |
| 41 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. AF Plate Load |
| 42 | 470KΩ | ½ | 73051 | BTS-470K | Yl.-Vi.-Yl. Output Grid |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PACKARD-BELL PART No. | IRC PART No. | |
| 43 | 560Ω | ½ | 73022 | BTS-560 | Grn.-Blue-Br. Feedback |
| 44 | 2000Ω | 2 | 73214 | AB-2000 | Filter |
| 45 | 150Ω | 1 | 73081 | BT-1-150 | Br.-Grn.-Br. Bias |
| 60 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. Series Phono |

*Items 21A, 21B & 35 are combined in one unit.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | PACKARD-BELL PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 46 | 117V AC @ .45A | 500V CT .06A DC | 4.7V AC @ 2.0A | 6.0V AC @ 2.2A | 89016 | P-6119# | T22R02# | P-2951# |

#Add series resistor to reduce plate voltage.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | PACKARD-BELL PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 47 | 4900Ω | 3.1Ω | 800Ω | .9Ω | 89405 | A-3877† | T22S58 | A-2930† | †Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD | VC IMP. | PACKARD-BELL PART No. | JENSEN PART No. | QUAM PART No. | |
| 48 | PM | 3.1Ω | 83703 | ST-119‡ Mod. P10-T | 10A31 | ‡Replace output transformer to match 6-8Ω voice coil. |
| | CONE DIA. | VC DIA. | | | | |
| 49 | 9-3/4" | 9/16" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | PACKARD-BELL PART No. | MEISSNER PART No. |
| 50 | Loop Antenna | | .4Ω | 92194 | |
| 51 | Ant. Coil | | 5.4Ω | 29400-B | |
| 52 | RF Coil | 86Ω | 5.3Ω | 29102-F | 14-1057 |
| 53 | Osc. Coil | 1Ω | 5.9Ω | 29205-C | 14-1060 |
| 54 | Input IF | 17.2Ω | 17.2Ω | 29004-E | 16-6658 |
| 55 | Output IF | 21Ω | 21Ω | 29007 | 16-6660 |

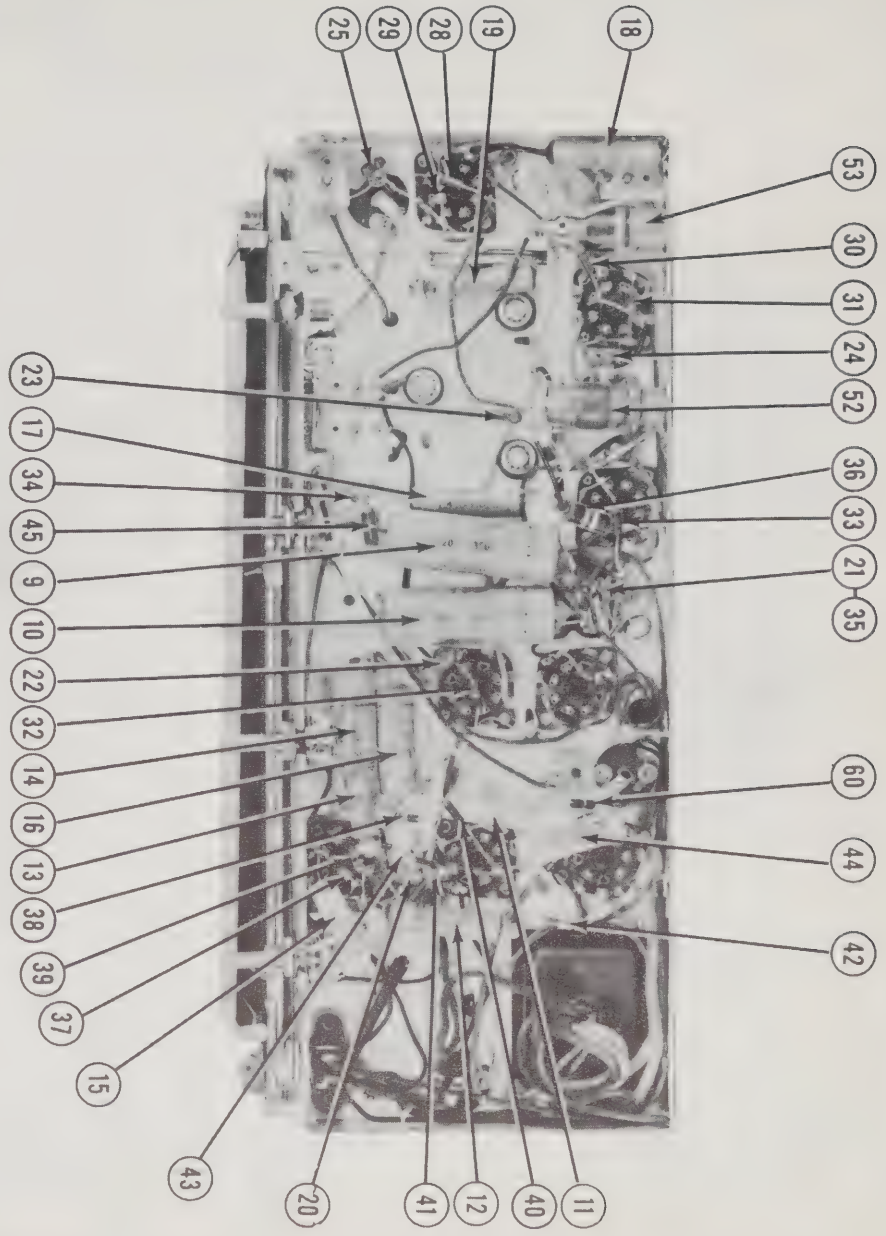
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | PACKARD-BELL PART No. | | |
| 56 | Bayonet | 6-8 | 0.25 | Blue | 54001 | | Type 44 |
| 57 | " | 6-8 | 0.25 | " | 54001 | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | PACKARD-BELL PART No. | NOTES |
|---|---|---|---|
| 58 | Switch | 86008 | Radio-Phono |
| 59 | 3 Gang Var. Cap. | 23520 | (30-495MMF) each section |
| A5 } A8 } A7 | Trimmer Strip | 23401 | { Osc. Adj. Ant. Adj. |
| A7 | Trimmer | 23406 | RF Adj. |
| | Dial | 38088 | Stationized |
| | " | 38089 | Eastern |
| | Knob | 52015C | |

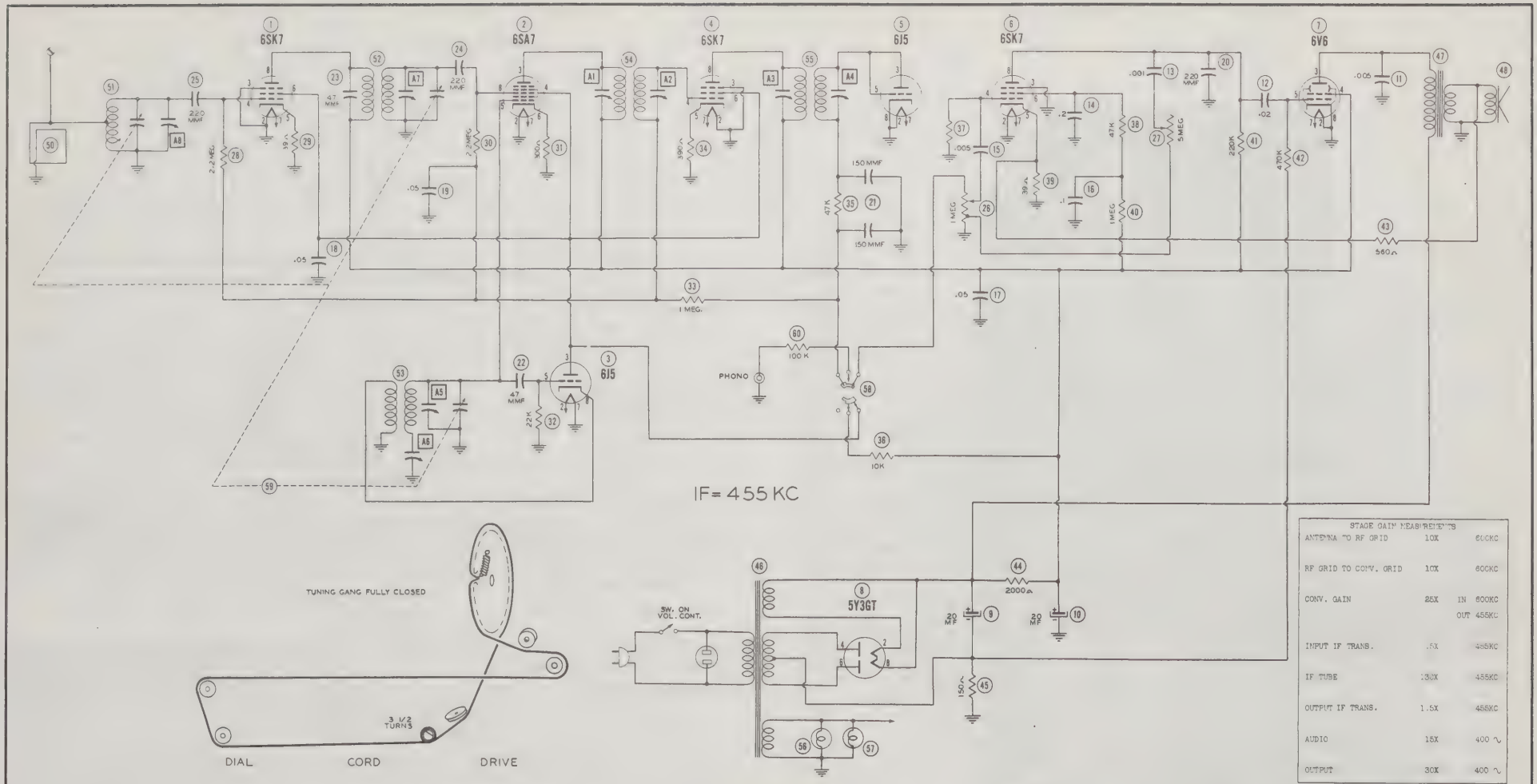
# CHASSIS—BOTTOM VIEW








PACKARD-BELL MODELS 673A, 673B, 880, 880A




STAGE GAIN MEASUREMENTS

| | | | |
|---|---|---|---|
| ANTENNA TO RF GRID | 10X | | 600KC |
| RF GRID TO CONV. GRID | 10X | | 600KC |
| CONV. GAIN | 25X | IN | 600KC |
| | | OUT | 455KC |
| INPUT IF TRANS. | .5X | | 455KC |
| IF TUBE | 130X | | 455KC |
| OUTPUT IF TRANS. | 1.5X | | 455KC |
| AUDIO | 15X | | 400 ∿ |
| OUTPUT | 30X | | 400 ∿ |

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SK7 | [illegible] | [illegible] | [illegible] | -.2VDC | -.1VDC | [illegible]VDC | 6VAC | 215VDC |
| 2 | 6A7 | [illegible] | [illegible] | [illegible] | [illegible] | 0V. | 11.4VDC | 6VAC | -.2VDC |
| 3 | 6J5 | [illegible] | [illegible] | [illegible]VAC | [illegible]VDC | [illegible] | -1.4VDC | 0V. | [illegible] |
| 4 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | -1.5VDC | [illegible] | [illegible] | [illegible] |
| 5 | [illegible] | [illegible] | [illegible] | [illegible] | 3V. | -.6VDC | 0V. | 6VAC | 0V. |
| 6 | [illegible]7 | [illegible] | [illegible] | [illegible] | -.3VDC | 0V. | 14VDC | 6VAC | 50VDC |
| 7 | [illegible] | [illegible] | [illegible] | 240VDC | -10VDC | -6VDC | 0V. | 6VAC | 0V. |
| 8 | [illegible] | [illegible] | 265VDC | -10VDC | 260VAC | 0V. | 260VAC | 6V. | 265VDC |

TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SK7 | [illegible] | 1Ω | 0Ω | 4.2 Meg. | 30Ω | 49KΩ | .1Ω | 32K. |
| 2 | 6A7 | [illegible] | 0Ω | 32KΩ | 42KΩ | INF. | 330Ω | .1Ω | [illegible] |
| 3 | 6J5 | 0Ω | .1Ω | 42KΩ | INF. | 22KΩ | INF. | 0Ω | 1Ω |
| 4 | [illegible]7 | [illegible] | [illegible] | [illegible] | 2 Meg. | 330Ω | 42KΩ | .1Ω | 32KΩ |
| 5 | [illegible] | [illegible] | [illegible] | [illegible] | 1 Meg. | INF. | 1 Meg. | INF. | .1Ω | [illegible] |
| 6 | 6SK7 | 0Ω | 0Ω | 0Ω | 4.7 Meg. | 39Ω | 1.4 Meg. | .1Ω | 250KΩ |
| 7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | .1Ω | [illegible] |
| 8 | 5Y3GT | INF. | 30KΩ | 150Ω | 2800 | INF. | [illegible] | INF. | [illegible] |

RADIO-PHONO SWITCH IN RADIO POSITION

RESISTANCE READINGS IN THE B- CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS. THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

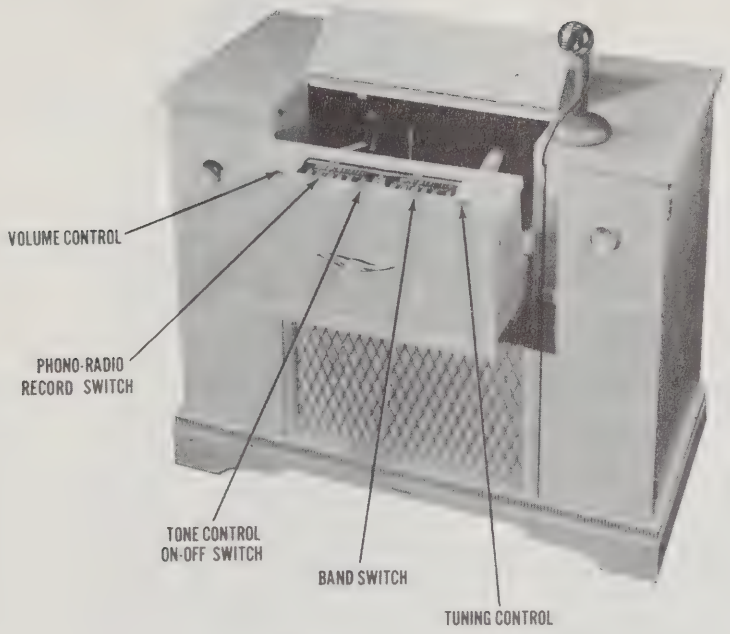
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1948

4816-18

**The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.**

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**




PACKARD-BELL MODEL 1273

| | |
|---|---|
| TRADE NAME | Packard-Bell, Model 1273 |
| MANUFACTURER | Packard-Bell Co., 3443 Wilshire Blvd., Los Angeles, Calif. |
| TYPE SET | AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna |
| TUBES (THIRTEEN) | Types, 6BA6 RF Amp., 6BA6 Mixer, 6AU6 or 6C4 Oscillator, 6BA6 1st IF Amp., 6BA6 2nd IF Amp., 6AL5 FM Ratio Det., 6H6 AM Det.-AVC-Comp. Rectifier, 6U5 Tuning Eye, 6SF7 1st AF Amp., 6SN7GT 2nd AF-Phase Inv., (2) 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 110-120 Volts AC-DC — RATING .79 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1620KC — FREQ. MOD. 87.5-108.5MC |

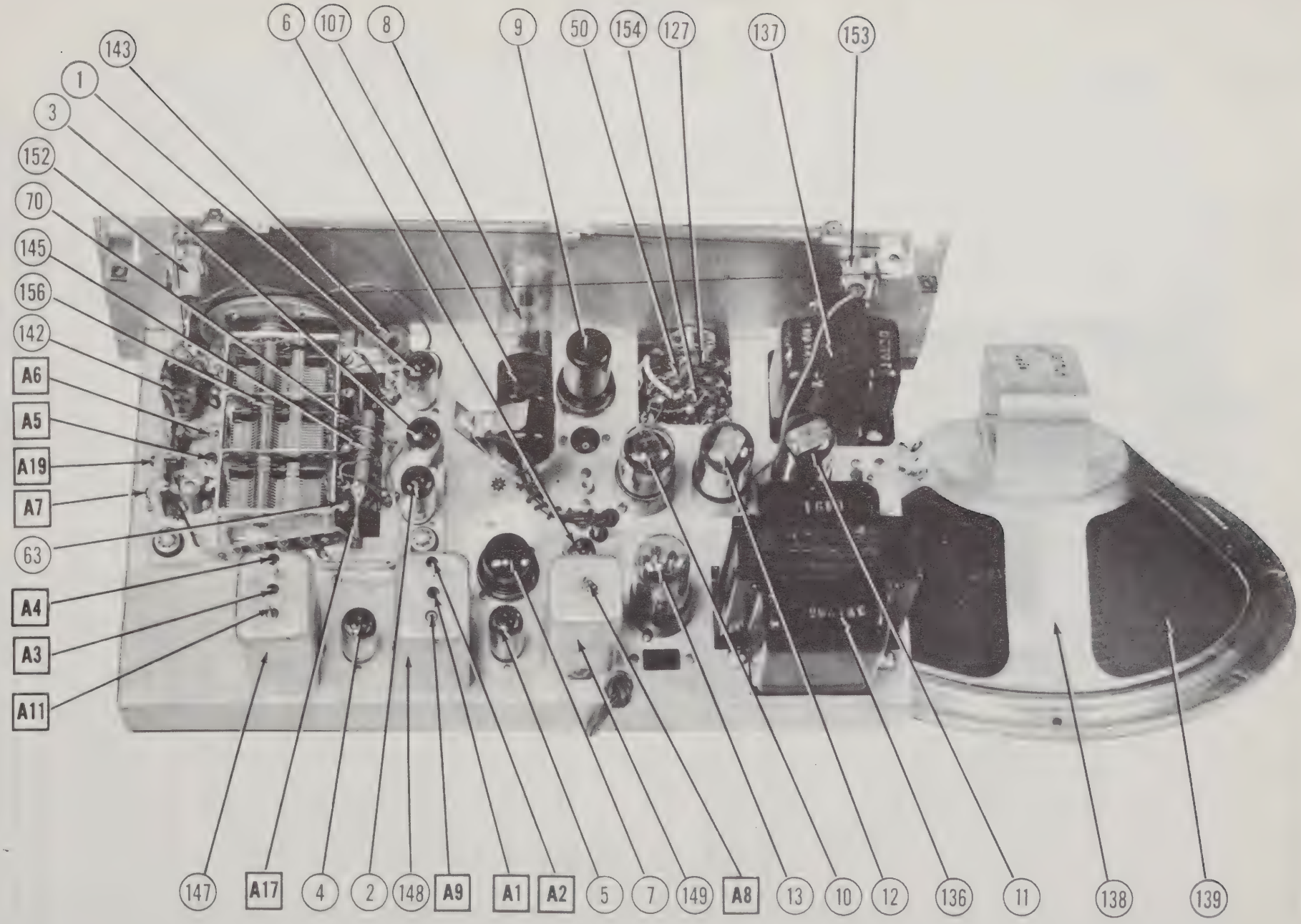
DISASSEMBLY INSTRUCTIONS

1. Remove twelve wood screws holding panel over rear of speaker compartment.
2. Remove loop antenna plugs from terminal strip on rear of cabinet.
3. Remove FM antenna plugs from terminal strip on rear of cabinet.
4. Remove speaker plug from receptacle located under record changer mounting board.
5. Remove one wood screw holding drawer stop.
6. Slide record changer drawer out front of cabinet.
7. Remove two screws holding panel over top of chassis. Remove panel.
8. Remove AM & FM antenna leads from rear of tuning condenser.
9. Remove speaker plug from chassis.
10. Remove microphone plug from chassis.
11. Remove phono-pickup plug from chassis.
12. Remove recording cartridge pickup plug from chassis.
13. Remove phono-motor plug from chassis.
14. Remove four machine screws holding chassis in drawer. Lift chassis out top of drawer.
15. Remove four Phillips head screws holding the two clamps at the bottom of speaker. Remove clamps from cabinet.
16. Slide speaker from under the two clamps at the top and remove from cabinet.

HOWARD W. SAMS & CO., INC. • • Indianapolis , Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-19 SET #46-FOLDER #19


6
107
8
9
50
154
127
137
153
143
1
3
152
70
145
156
142
A6
A5
A19
A7
63
A4
A3
A11
147
A17
4
2
148
A9
A1
A2
5
7
149
A8
13
10
12
136
11
138
139

**PACKARD-BELL MODEL 1273**

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 6BA6 | 6BA6 | 7BK | |
| 2 | Mixer | 6BA6 | 6BA6 | 7BK | |
| 3A | Oscillator | 6AU6 | 6AU6 | 7BK | |
| B | " | 6C4 | 6C4 | 6BG | |
| 4 | 1st IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 5 | 2nd IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 6 | FM Ratio Det. | 6AL5 | 6AL5 | 6AT | |
| 7 | AM Det.-AVC-Comp. Rect. | 6H6 | 6H6 | 7A | |
| 8 | Tuning Eye | 6U5 | 6U5 | 6R | |
| 9 | 1st AF Amp. | 6SF7 | 6SF7 | 7AZ | |
| 10 | 2nd AF-Inv. | 6SN7GT | 6SN7GT | 8CD | |
| 11 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 12 | " " | 6V6GT | 6V6GT | 7AC | |
| 13 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: SOLAR PART No. | REPLACEMENT DATA: SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 14 | 40 | 450 | 24030 | PRS450/40 | BR4045 | M-40-450 | EL-4 | Filter |
| 15 | 40 | 350 | 24004B | PRS450/40 | BR4045 | M-40-350 | UT-30 | " |
| 16 | 30 | 350 | 24016 | PRS450/30 | BR3045 | M-30-350 | UT-203 | " |
| 17 | 25 | 25 | 24006 | PRS25/25 | BR252A | M-25-25 | TA-25 | Cathode Bypass |
| 18 | 5 | 150 | 24038 | PRS50/4 | BR415 | M-8-150 | UT-41 | Stabilizing Cap. |
| 19 | .01 | 125 | | 484-01 | DT4S1 | ST-4-01 | TC-11 | Line Filter |
| 20 | .01 | 125 | | 484-01 | DT4S1 | ST-4-01 | TC-11 | " " |
| 21 | .05 | 400 | | 484-05 | DT4S5 | ST-4-05 | TC-15 | RF Bypass Power Supply |
| 22 | .002 | 600 | 23002 | 684-002 | DT6D2 | ST-6-002 | TC-22 | Output Plate Bypass |
| 23 | .002 | 600 | 23002 | 684-002 | DT6D2 | ST-6-002 | TC-22 | " " " |
| 24 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | RF Bypass Power Supply |
| 25 | .02 | 600 | 23007 | 684-02 | DT6S2 | ST-6-02 | TC-12 | Audio Coupling |
| 26 | .02 | 600 | 23007 | 684-02 | DT6S2 | ST-6-02 | TC-12 | " " |
| 27 | .01 | 400 | 23022 | 484-01 | DT4S1 | ST-4-01 | TC-11 | " " |
| 28 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | Tone Comp. |
| 29 | .003 | 600 | 23016 | 684-003 | DT6D3 | ST-6-003 | TC-23 | " " |
| 30 | .02 | 600 | 23007 | 684-02 | DT6S2 | ST-6-02 | TC-12 | Audio Coupling |
| 31 | .005 | 600 | 23004 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Tone Comp. |
| 32 | .1 | 400 | 23011 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | 1st AF Decoupling |
| 33 | .2 | 400 | 23020 | 484-.2 | DT4P2 | ST-4-2 | TC-2 | 1st AF Screen Bypass |
| 34 | .1 | 200 | 23019 | 484-.1 | DT2P1 | ST-2-1 | TC-1 | Compression Bias Filter |
| 35 | .005 | 600 | 23004 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Audio Coupling |
| 36 | .005 | 600 | 23004 | 684-005 | DT6D5 | ST-6-005 | TC-25 | " " |
| 37 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | AVC Filter |
| 38 | .003 | 600 | 23016 | 684-003 | DT6D3 | ST-6-003 | TC-23 | De-emphasis |
| 39 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | 2nd IF Plate Decoup. |
| 40 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | 2nd IF Screen Bypass |
| 41 | .02 | 600 | 23007 | 684-02 | DT6S2 | ST-6-02 | TC-12 | Audio Coupling |
| 42 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | 1st IF Decoupling |
| 43 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | 1st IF Screen Bypass |
| 44 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | AVC Filter |
| 45 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | Mixer Plate Decoup. |
| 46 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | Mixer Cathode Bypass |
| 47 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | AVC Filter |
| 48 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | RF Plate Decoup. |
| 49 | .01 | 500 | 23023 | 684-01 | DT6S1 | ST-6-01 | TC-11 | " " " |
| 50 | 220 | 300 | 23915 | 1468-0002 | 5W5T2 | MO.5-32 | 1FM-32 | Phono Tone Comp.-Cer. |
| 51 | 4000 | 300 | 23208 | 1467-004 | 1D5D4 | MW.5-24 | 1FM-24 | Tone Comp. |
| 52 | 100 | 500 | 23914 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | RF Bypass-Cer. |
| 53 | 470 | 300 | 23916 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | " " " |
| 54 | 470 | 300 | 23916 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Diode Load Cap.-Cer.-Note |
| 55 | 470 | 300 | 23916 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | " " " " " |
| 56 | 220 | 500 | 23915 | 1468-0002 | 5W5T2 | MO.5-32 | 1FM-32 | 1st IF Plate Decoup. |
| 57A | 100 | 300 | * | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Diode RF Filter-Cer. |
| B | 100 | 300 | * | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | " " " " |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 105 | 10KΩ | ½ | 73047 | BTS-10KΩ | Br.-Blk.-Or. FM Output Load |
| 106 | 1 Meg. | ½ | 73063 | BTS-1 Meg. | Br.-Blk.-Grn. Tuning Eye Grid |
| 107 | 1 Meg. | ½ | 73063 | BTS-1 Meg. | Br.-Blk.-Grn. Tuning Eye Plate Load |
| 108 | 470KΩ | ½ | 73051 | BTS-470K | Yl.-Vi.-Yl. Compression Bias Network |
| 109 | 1 Meg. | ½ | 73063 | BTS-1 Meg. | Br.-Blk.-Grn. Compression Bias Network |
| 110 | 4.7 Meg. | ½ | 73057 | BTS-4.7 Meg. | Yl.-Vi.-Grn. Compression Diode Filter |
| 111 | 220K | ½ | 73049 | BTS-220K | Red-Red-Yl. Compression Diode Load |
| 112 | 4.7 Meg. | ½ | 73057 | BTS-4.7 Meg. | Yl.-Vi.-Grn. 1st AF Grid |
| 113 | 1.5 Meg. | ½ | 73054 | BTS-1.5 Meg. | Br.-Grn.-Grn. 1st AF Screen |
| 114 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. 1st AF Plate Load |
| 115 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. 1st AF Decoup. |
| 116 | 56KΩ | ½ | 73060 | BTS-56K | Grn.-Blue-Or. Tone Comp. |
| 117 | 15KΩ | ½ | 73039 | BTS-15K | Br.-Grn.-Or. " " |
| 118 | 1 Meg. | ½ | 73053 | BTS-1 Meg. | Br.-Blk.-Grn. 2nd AF Grid |
| 119 | 3900Ω | ½ | 73038 | BTS-3900 | Or.-White-Red 2nd AF Cathode |
| 120 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. 2nd AF Plate Load |
| 121 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. Phase Inv. Plate Load |
| 122 | 6800Ω | ½ | 73035 | BTS-6800 | Blue-Gray-Red Phase Inv. Grid |
| 123 | 100KΩ | ½ | 73047 | BTS-100K | Br.-Blk.-Yl. Output Grid |
| 124 | 100KΩ | ½ | 73047 | BTS-100K | Br.-Blk.-Yl. " " |
| 125 | 330Ω | 2 | 73131 | BT-2-330 | Or.-Or.-Br. Output Cathode-See Note |
| 126 | 15Ω | 1 | 73115 | BW-1-15 | Recording Head Shunt |
| 127 | .5Ω | 1 | 73910 | BW-1-.47 | Speaker Shunt |
| 128 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. Series Phono |
| 129 | 27KΩ | ½ | 73042 | BTS-27K | Red-Vi.-Or. Feedback |
| 130 | 1.5 Meg. | ½ | 73054 | BTS-1.5 Meg. | Br.-Grn.-Grn. " |
| 131 | 1000Ω | 5 | 73915 | AB-1000 | Filter |
| 132 | 1000Ω | 2 | 73120 | BT-2-1000 | Br.-Blk.-Red " |
| 133 | 1000Ω | 2 | 73120 | BT-2-1000 | Br.-Blk.-Red " |
| 134 | 10Ω | ½ | | | Br.-Blk.-Blk. Parasitic Supp. |
| 135 | 10Ω | ½ | | | Br.-Blk.-Blk. " " |

*Items 57A, 57B & 92 are part of resistor-capacitor combination and may be obtained under Part No. 23930.

Note-Some models use two 680Ω 1 Watt resistor in parallel in this application.

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDARSON PART No. | REPLACEMENT DATA: MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 136 | 117V AC @ .79A | 565V CT .107A DC | 5.1V AC @ 2.0A | 6.2V AC @ 4.2A | 69013 | | T22R32‡ | |

‡Add series resistor to reduce plate voltage.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDAR'N PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 137 | 10KΩ CT | 3.3Ω | 525Ω CT | .4Ω | 80404 | A-3839 | T22S64† | | †Drill new mounting holes. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: PACKARD-BELL PART No. | REPLACEMENT DATA: JENSEN PART No. | REPLACEMENT DATA: QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD | VC IMP. | | ST-102‡ | | |
| 138 | PM | 3.3Ω | 83602 | Mod. P12-S | 12A6‡ | ‡Replace output transformer to match 3-4Ω voice coil. |
| | CONE DIA. | VC DIA. | | | | |
| 139 | 11-3/8" | 1" | | | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | PACKARD-BELL PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 58 | 220 | 500 | 23915 | | | | | Fixed Trimmer |
| 59 | 5000 | 300 | 23931 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | Mixer Screen Byp.-Cer. |
| 60 | 470 | 300 | 23916 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Filament Bypass-Cer. |
| 61 | 47 | 300 | 23912 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Bypass - " |
| 62 | 47 | 300 | 23912 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Coupling - " |
| 63 | 220 | 300 | 23915 | 1468-0002 | 5W5T2 | MO.5-32 | 1FM-32 | " " - " |
| 64 | 5 | 300 | 23908 | 1468-000005 | 5W5V5 | MO.5-55 | MS-55 | " " - " |
| 65 | 5000 | 300 | 23931 | 1467-005 | 1D5D5 | MW.5-25 | 1FM-25 | RF Screen Bypass-Cer. |
| 66 | 470 | 300 | 23916 | 1468-0005 | 5W5T5 | MO.5-35 | 1FM-35 | Filament Byp. - " |
| 67 | 47 | 300 | 23912 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Cathode Byp. - " |
| 68 | 220 | 300 | 23915 | 1468-0002 | 5W5T2 | MO.5-32 | 1FM-32 | RF Coupling - " |
| 69 | 47 | 300 | 23912 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap. - " |
| 70 | 470 | 300 | 23916 | | | | | Fixed Padder - " |
| 71 | 47 | 300 | 23912 | | | | | Fixed Trimmer - " |

*Item 57A, 57B & 92 are part of resistor capacitor combination and may be obtained as a unit under Part Number 23930.

Note-When either Item 54 or 55 are replaced, replace both with capacitors of equal value.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PACKARD-B. PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 72A | 1 Meg. | ½ | 25016 | | | Volume Control-Front Section |
| B | 2 Meg. | ½ | | | | " " Center " |
| C | 1 Meg. | ½ | | | | " " Rear " |
| 73 | 3 Meg. | ½ | 25510 | | | Tone Control |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PACKARD-BELL PART No. | IRC PART No. | |
| 74 | 1 Meg. | ½ | 73053 | BTS-1 Meg. | Br.-Blk.-Grn. RF Grid |
| 75 | 270Ω | ½ | 73018 | | Red-Vi.-Br. RF Cathode |
| 76 | 39Ω | ½ | 73008 | | Or.-White-Blk. RF Cathode |
| 77 | 22KΩ | ½ | 73041 | BTS-22K | Red-Red-Or. RF Screen |
| 78 | 1000Ω | ½ | 73025 | BTS-1000 | Br.-Blk.-Red RF Plate Decoupling |
| 79 | 1000Ω | ½ | 73025 | BTS-1000 | Br.-Blk.-Red RF Plate Decoupling |
| 80 | 1000Ω | ½ | 73025 | BTS-1000 | Mixer Cathode |
| 81 | 220Ω | ½ | 73017 | | Red-Red-Br. " " |
| 82 | 22KΩ | ½ | 73041 | BTS-22K | Red-Red-Or. Mixer Screen |
| 83 | 1000Ω | ½ | 73025 | BTS-1000 | Br.-Blk.-Red Mixer Plate Decoup. |
| 84 | 1 Meg. | ½ | 73053 | BTS-1 Meg. | Br.-Blk.-Grn. Mixer Grid |
| 85 | 22KΩ | ½ | 73041 | BTS-22K | Red-Red-Or. Osc. Grid |
| 86 | 100KΩ | ½ | 73047 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 87 | 2.2 Meg. | ½ | 73055 | BTS-2.2 Meg. | Red-Red-Grn. " " |
| 88 | 68Ω | ½ | 73011 | | Blue-Gray-Blk. 1st IF Cathode |
| 89 | 10KΩ | 1 | 73073 | BTA-10K | Br.-Blk.-Or. 1st IF Screen |
| 90 | 27KΩ | ½ | 73042 | BTS-27K | Red-Vi.-Or. 1st IF Screen Bleeder |
| 91 | 1000Ω | ½ | 73025 | BTS-1000 | Br.-Blk.-Red 1st IF Plate Decoup. |
| 92 | 47KΩ | ½ | * | BTS-47K | Yl.-Vi.-Or. Diode Filter |
| 93 | 220KΩ | ½ | 73049 | BTS-220K | Red-Red-Yl. Diode Load |
| 94 | 68KΩ | ½ | 73046 | BTS-68K | Blue-Gray-Or. Diode Load |
| 95 | 10KΩ | ½ | 73033 | BTS-10K | Br.-Blk.-Or. Diode Load |
| 96 | 120Ω | ½ | 73014 | | Br.-Red-Br. 2nd IF Cathode |
| 97 | 22KΩ | ½ | 73041 | BTS-22K | Red-Red-Or. 2nd IF Screen |
| 98 | 1000Ω | ½ | 73025 | BTS-1000 | Br.-Blk.-Red 2nd IF Plate Decoup. |
| 99 | 120Ω | ½ | 73014 | | Br.-Red-Br. RF Filter |
| 100 | 27KΩ | ½ | 73042 | BTS-27K | Red-Vi.-Or. De-emphasis |
| 101 | 6800Ω | ½ | 73035 | BTS-6800 | Blue-Gray-Red Ratio Det. Diode Load |
| 102 | 6800Ω | ½ | 73035 | BTS-6800 | Blue-Gray-Red " " " " |
| 103 | 100KΩ | ½ | 73047 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 104 | 100KΩ | ½ | 73047 | BTS-100K | Br.-Blk.-Yl. FM Output Load |

DATE 9/48-#4816-19 SET #46-FOLDER #19

# PARTS LIST AND DESCRIPTIONS (Continued)

## R F COILS

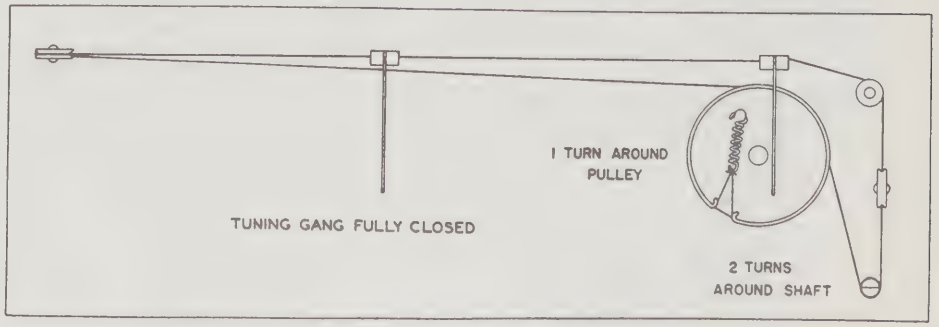
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | PACKARD-BELL PART No. | MEISSNER PART No. | |
| 140 | Loop Ant. | | 0Ω | | | |
| 141 | FM Di-Pole | | 0Ω | 29321 | | |
| 142 | BC Ant.Coil | | 5.4Ω | 29400 | | |
| 143 | FM " " | 0Ω | 0Ω | 29409 | | |
| 144 | BC RF Coil | 86Ω | 5.3Ω | 29102F | 14-1057 | |
| 145A | FM " " | | 0Ω | 29109 | | |
| B | FM Osc. Coil | | 0Ω | 29109 | | |
| 146 | BC " " | 1Ω | 5.9Ω | 29205C | 14-1060 | |
| 147A | AM 1st IF | 19Ω | 13Ω | 29011 | | |
| B | FM " " | 1.2Ω | .6Ω | | | |
| 148A | AM 2nd IF | 10.6Ω | 17Ω | 29012 | | |
| B | FM " " | 1.2Ω | .8Ω | | | |
| 149 | FM Det.Trans | 1.5Ω | .1Ω | 29018 | | |
| 150 | Plate Choke | | .1Ω | 29104 | | |
| 151 | Filament Choke | | .1Ω | 29104 | | |

## DIAL LIGHT

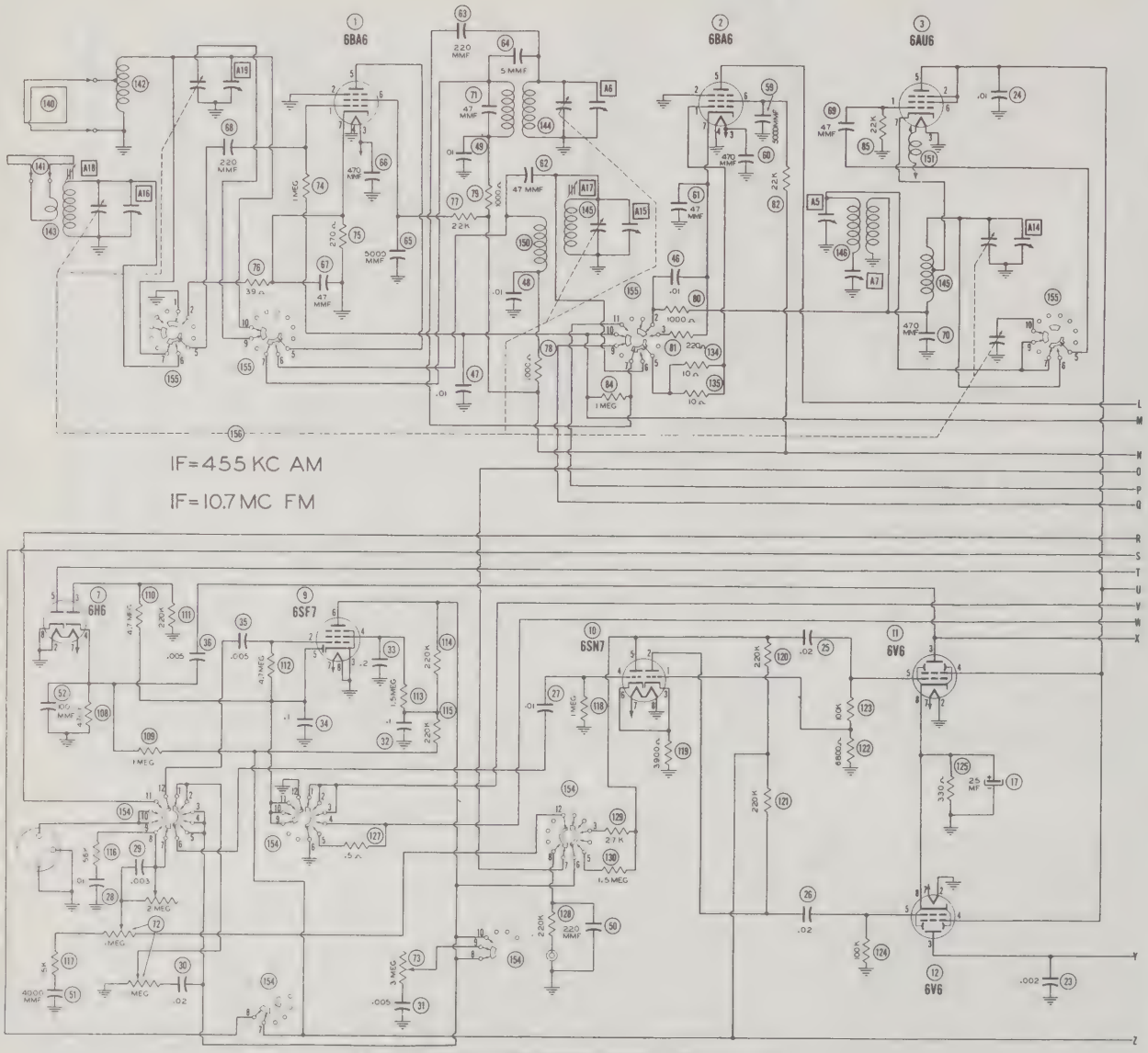
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | PACKARD-BELL PART No. | | |
| 152 | Bayonet | 6-8 | 0.15 | Brown | 54001 | | Type 47 |
| 153 | " | 6-8 | 0.15 | " | 54001 | | " " |

## MISCELLANEOUS

| ITEM No. | PART NAME | PACKARD-BELL PART No. | NOTES |
|---|---|---|---|
| 154 | Switch | 86009A | Phono-Record |
| 155 | " | 86017B | Band |
| 156 | 3 Gang Var. Cap. | 23525 | (45-495MMF) each section |
| A5 } | Trimmer Strip | 23401 | {BC Osc. Adj. |
| A6 } | | | { " RF " |
| A7 | Padder | 23402 | BC Osc. Adj. |
| A14 | Trimmer | 23409 | FM " " |
| A15 } | Trimmer Strip | 23408 | {FM RF Adj. |
| A16 } | | | {FM Ant. Adj. |
| A19 | Trimmer | 23406 | BC Ant. Adj. |
| | Dial | 38073 | Stationized |
| | Pointer Assby. | 67030 | |



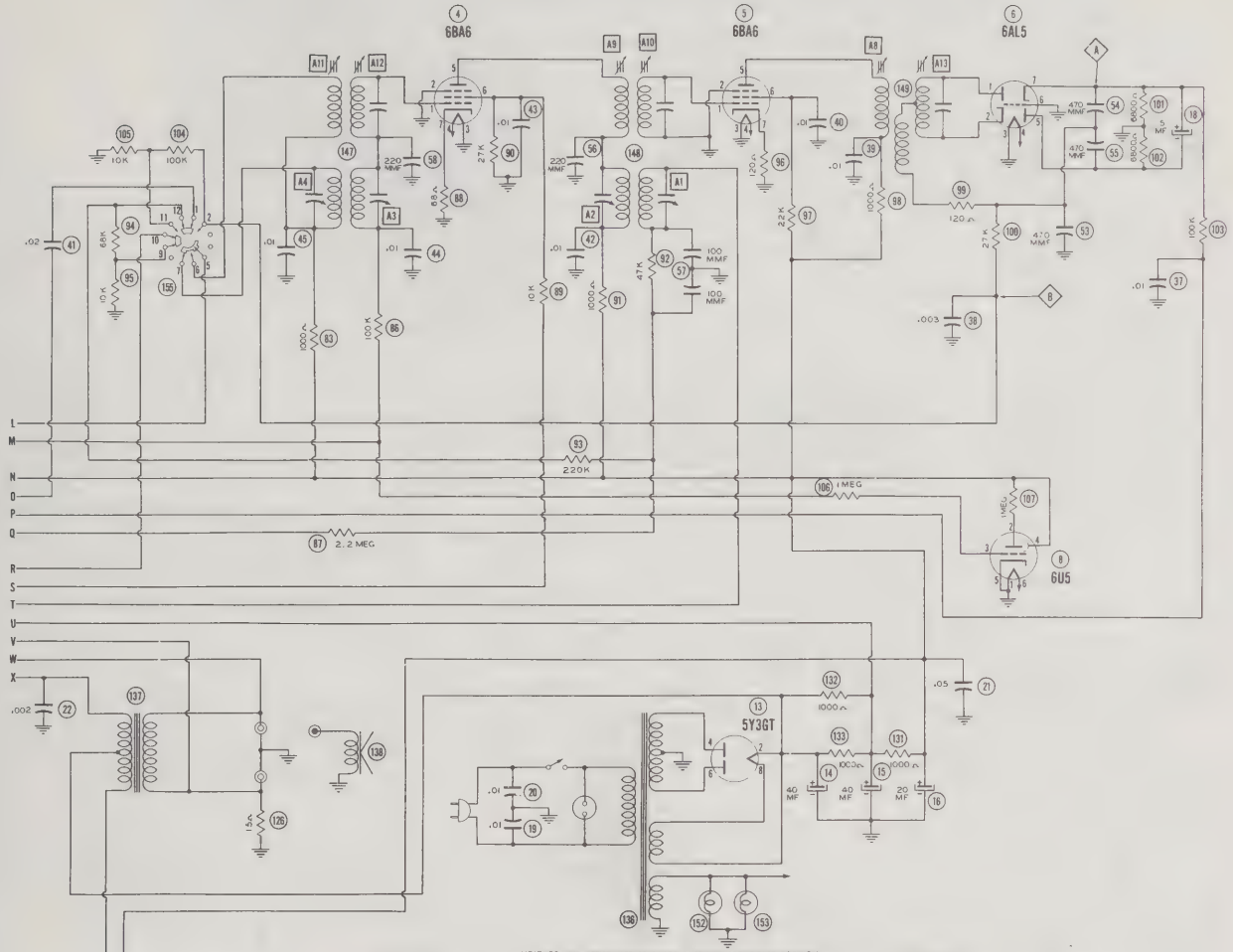

Dial Cord Diagram




| STAGE GAIN MEASUREMENTS | | |
|---|---|---|
| RF GRID TO CONV. GRID | 10X | 600KC |
| CONVERSION GAIN | 20X | IN 600KC<br>OUT 455K |
| INPUT IF TRANS. | .5X | 455KC |
| IF TUBE | .4 X | 4 [illegible] |
| OUTPUT IF TRANS. | .9X | 4 [illegible] KC |
| [illegible] | 45X | 4 [illegible] |
| [illegible] | .2X | 4 K [illegible] |
| [illegible] | .7Y | 4 [illegible] |

**The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1948




VOLTAGE READINGS

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BA6 | -.2VDC | 0V. | 6.2VAC | 0V. | 110VDC | 110VDC | 3VDC | - |
| 2 | 6BA6 | -.3VDC | 0V. | 6.2VAC | 0V. | 150VDC | 110VDC | 7VDC | - |
| 3 | 6AL5 | -4VDC | 150VDC | 0V. | 6.2VAC | 154VAC | 150VDC | 0V. | - |
| 4 | 6BA6 | -.2VDC | 0V. | 0V. | 6.2VAC | 150VDC | 100VDC | 1VDC | - |
| 5 | 6BA6 | 0V. | 0V. | 0V. | 6.2VAC | 190VDC | 100VDC | 1.5VDC | - |
| ‡ 6 | 6AL5 | -.2VDC | 0V. | 0V. | 6.2VAC | 4VDC | 0V. | 4VDC | - |
| 7 | 6U5 | 0V. | 0V. | 0V. | 355VDC | -.6VDC | 0V. | 6.2VAC | 0V. |
| 8 | 6U5 | - | - | - | - | - | - | - | - |
| 9 | 6SN7 | 0V. | -.2VDC | 0V. | 6.4VDC | 0V. | 5.6VDC | .2VAC | 0V. |
| 10 | 6SN7 | 0V. | 6.0VDC | 2.2VAC | 0V. | 0VDC | 3.2VDC | 6.2VAC | 0V. |
| 11 | 6V6GT | 0V. | 0V. | 240VAC | 240VAC | 0V. | 0V. | 6.2VAC | 17VDC |
| 12 | 6V6GT | 0V. | 0V. | 280VDC | 240VAC | 0V. | 240VDC | 7.2VAC | 17VDC |
| 13 | 5Y3GT | 0V. | 280VDC | 0V. | 240VAC | 240VAC | 2.0VAC | 180VDC | 280VDC |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6BA6 | 4.5 Meg. | 0Ω | 1Ω | 2Ω | 350Ω | 100Ω | 0Ω | - |
| 2 | 6BA6 | 4.5 Meg. | 0Ω | 0Ω | - | 0Ω | 0Ω | 1Ω | - |
| 3 | 6AL5 | 2.2K | 270Ω | 0Ω | 1Ω | 3.5K | 0Ω | 0Ω | - |
| 4 | 6BA6 | 3 Meg. | 0Ω | - | 1Ω | 0Ω | 0Ω | 0Ω | - |
| 5 | 6BA6 | 0Ω | 0Ω | 0Ω | 1Ω | 450Ω | 0Ω | 0Ω | - |
| ‡ 6 | 6AL5 | 230KΩ | 2.2MΩ | 0Ω | 2Ω | 0Ω | 0Ω | 0Ω | 0Ω |
| 7 | 6U5 | - | - | 0Ω | 47KΩ | ∞ | ∞ | 0Ω | 0Ω |
| 8 | 6U5 | - | - | - | - | - | - | - | - |
| 9 | 6SN7 | 0Ω | 4.7 MegΩ | 0Ω | ∞ | ∞ | 0Ω | 0Ω | 0Ω |
| 10 | 6SN7 | 1 MegΩ | 2.2MΩ | 0Ω | ∞ | ∞ | 0Ω | 0Ω | 0Ω |
| 11 | 6V6GT | 0Ω | 1Ω | 0Ω | 270Ω | 270Ω | 0Ω | 0Ω | 0Ω |
| 12 | 6V6GT | 0Ω | 0Ω | 0Ω | 0Ω | 100KΩ | 0Ω | 1Ω | 0Ω |
| 13 | 5Y3GT | INF. | INF. | INF. | 0Ω | 21KΩ | 0Ω | 0Ω | 0Ω |

‡TAKEN WITH VACUUM TUBE VOLTMETER.

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION RADIO-PHONO SWITCH IN RADIO POSITION

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1948

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.
Use insulated alignment screwdriver for all adjustments.

### AM ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .01 MFD | High side to Pin 1 (grid) of 6BA6 Mixer (2). Low side to chassis. | 455KC | BC (fully counter-clock-wise) | Tuning cap. fully closed | Across voice coil. | A1,A2, A3,A4. | Adjust for maximum output. |
| 2 | .01 MFD | High side to Pin 1 (grid) of 6BA6 RF Tube (1). Low side to chassis. | 1500KC | " | 1500KC | " | A5,A6 | " " " " |
| 3 | .01 MFD | " | 600KC | " | Tune for maximum output. | " | A7 | Rock tuning cap. and adjust for maximum output. Repeat Steps 2 & 3 until no further improvement can be made. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4 | .01 MFD | High side to Pin 1 (grid) of 6BA6 RF Tube (1). Low side to chassis. | 10.7MC (Unmodulated) | FM (Clock-wise) | Tuning cap. fully closed | DC probe to Point A. Common to chassis | A6,A9, A10,All, A12 | Adjust for maximum deflection. |
| 5 | .01 MFD | " | " | " | " | DC probe to Point B. Common to chassis | A13 | Use a zero center scale meter if available. Adjust for zero deflection. Continue with FM-RF Alignment in Step 7. |

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4 | .01 MFD | High side to Pin 1 (grid) of 6BA6 1st IF Tube (4). Low side to chassis. | 10.7MC (Freq. Modulated) | FM (Clock-wise) | Tuning cap. fully open. | Vertical input to Point A. Ground to chassis. | A8,A9, A10 | Disconnect 5 MFD cap. from Point A. Adjust A8, A9 and A10 for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 5 | .01 MFD | High side to Pin 1 (grid) of 6BA6 Mixer (2). Low side to chassis. | " | " | " | " | All, A12 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 6 | .01 MFD | High side to Pin 1 (grid) of 6BA6 1st IF Tube (4). Low side to chassis. | " | " | " | Vertical input to Point B. Ground to chassis. | A13 | Reconnect 5 MFD. cap. to Point A. Adjust A13 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Continue with FM-RF Alignment in Step 7. |

### FM RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7 | 270Ω carbon res. | High side to one FM ant. terminal. Low side to the other FM ant. terminal. | 108MC (Unmodulated) | FM | 108MC | DC probe to Point A. Common to chassis | A14 | Adjust for maximum deflection. |
| 8 | " | " | " | " | Tune for maximum deflection. | " | A15, A16 | Rock tuning cap. and adjust for maximum deflection. |
| 9 | " | " | 88MC | " | " | " | A17, A18 | Adjust for maximum deflection. Repeat Steps 7, 8 & 9 until no further improvement can be made. Reassemble receiver in cabinet with loop connected. |
| 10 | | Loop | 1500KC | BC | Tune for max. volume. | | A19 | Adjust for maximum volume. |

FIG. 1

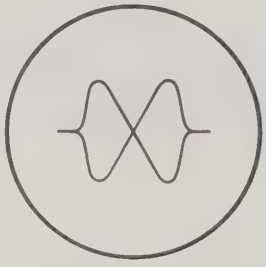
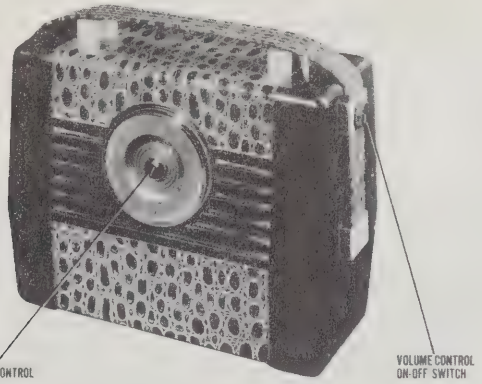


FIG. 2

# RCA (VICTOR) MODEL 8BX5
# (Ch. RC-1059 BATTERY-LINE OPERATED

RCA (VICTOR) MODEL 8BX5
(Ch. RC-1059 BATTERY-LINE OPERATED



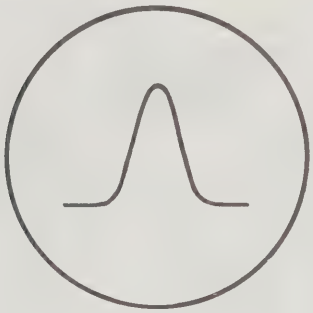



FIG. 1

| | |
|---|---|
| **TRADE NAME** | RCA (Victor) Model 8BX5 (Ch. RC-1059) |
| **MANUFACTURER** | RCA Victor Div., Radio Corp. of America, Camden, N.J. |
| **TYPE SET** | Three Power Operated Portable Superheterodyne Receiver with Loop Antenna |
| **TUBES (FIVE)** | Types, 1R5 Converter, 1T4 IF Amp., 1U5 Det.-AVC-AF, 3V4 Power Output, 117Z3 Rect. |
| **POWER SUPPLY RATING** | 110-125 Volts AC-DC or 7.5 Volts "A" Supply and 75 Volts "B" Supply in Pack Form<br>.15 Amp. @ 117 Volts AC or 55MA @ 7.5 Volts DC and 7.5 MA @ 75 Volts DC |
| **TUNING RANGE—BROADCAST** | 540-1600KC |

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-. Use insulated alignment screwdriver for all adjustments.

### IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. mod. signal with 40KC sweep & 60 ∿ modulation. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .01 MFD. | High side to Pin 6 (grid) of 1T4. Low side to chassis. (Shunt large section of tuning cap. with 10KΩ carbon res.) | 455KC (Freq. Mod.) | Tuning cap. fully closed | Vertical input to Point Ⓐ. Ground to chassis. | A1,A2 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 2 | .01 MFD | High side to large stator of tuning cap. Low side to chassis. | " | " | " | A3,A4 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Remove 10KΩ resistor from tuning cap. Replace bottom cover plate, install receiver in cabinet and continue with RF alignment Step 3. |

### IF ALIGNMENT USING AM SIGNAL GENERATOR AND OUTPUT METER

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .01 MFD | High side to large stator of tuning cap. Low side to chassis. (Shunt large section of tuning cap. with 10KΩ carbon resistor) | 455KC | Tuning cap. fully closed | Across voice coil | A1,A2, A3,A4 | Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF. to reduce hum modulation. Remove 10KΩ resistor from tuning cap. Replace bottom cover plate, install receiver in cabinet and continue with RF alignment in Step 3. |

### RF ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 3 | | Place sig. gen. lead near loop of receiver. | 1600KC | Tuning cap. fully open. | Across voice coil | A5, | Adjust for maximum output. |
| 4 | | " | 1400KC | Tune for maximum output. | " | A6 | " " " " |
| 5 | | " | 600KC | " | " | A7 | Rock tuning cap. and adjust for maximum output. Repeat Steps 3, 4 & 5 until no further improvement can be made. |

**HOWARD W. SAMS & CO., INC.** • • **Indianapolis, Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

RCA (VICTOR) MODEL 8BX5

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: RCA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | Converter | 1R5 | 1R5 | 7AT | |
| 2 | IF Amp. | 1T4 | 1T4 | 6AR | |
| 3 | Det.-AVC-AF | 1U5 | 1U5 | 6BW | |
| 4 | Power Output | 3V4 | 3V4 | 6BX | |
| 5 | Rectifier | 11723 | 11723 | 4BR | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: RCA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 6A | 50 | 150 | 73127 | AF106D20A# | UP6CJ64# | DY-304# | EL351 | ■ Filter |
| B | 30 | 150 | | PRS25/50 | BR5C2 | M-50-25 | TA50 | ▲ " |
| C | 160 | 25 | | | | | | Filament Bypass |
| 7 | .05 | 400 | 70615 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Rectifier Bypass |
| 8 | .1 | 400 | 70617 | 484-.1 | DT4P1 | ST-4-1 | TC-1 | Line Isolation |
| 9 | .005 | 400 | 72791 | 484-005 | DT6D5 | ST-6-005 | TC-25 | Output Plate Bypass |
| 10 | .002 | 200 | 72315 | 484-002 | DT6D2 | ST-6-002 | TC-22 | Audio Coupling |
| 11 | .002 | 200 | 72315 | 484-002 | DT6D2 | ST-6-002 | TC-22 | " " |
| 12 | .02 | 100 | | 484-02 | DT2S2 | ST-4-02 | TC-12 | AF Screen Bypass |
| 13 | .01 | 100 | | 484-01 | DT2S1 | ST-4-01 | TC-11 | RF Bypass Pwr. Supply |
| 14 | .05 | 100 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | Fil. Bypass |
| 15 | .003 | 200 | 71921 | 484-003 | DT2D3 | ST-6-003 | TC-23 | IF Grid Filter |
| 16 | .05 | 400 | 70615 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Screen Decoupling |
| 17 | .05 | 100 | | 484-05 | DT2S5 | ST-4-05 | TC-15 | Fil. Bypass |
| 18 | .1 | 100 | | 484-.1 | DT2P1 | ST-2-1 | TC-1 | " " |
| 19 | .05 | 400 | 70615 | 484-05 | DT4S5 | ST-4-05 | TC-15 | AVC Filter |
| 20 | 100 | 500 | 73152 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | AF Plate Bypass-Cer. |
| 21 | 4 | 300 | 73153 | 1468-000005 | 5W5V5 | MO.5-55 | MS-55 | Neutralizing Cap.-Cer. |
| 22 | 56 | 300 | 71824 | 1469-00005 | 5R5Q5 | MO8.5-45 | MS-45 | Osc. Grid Cap.-Cer. |

#Parallel sections to obtain desired capacity.

## CONTROLS

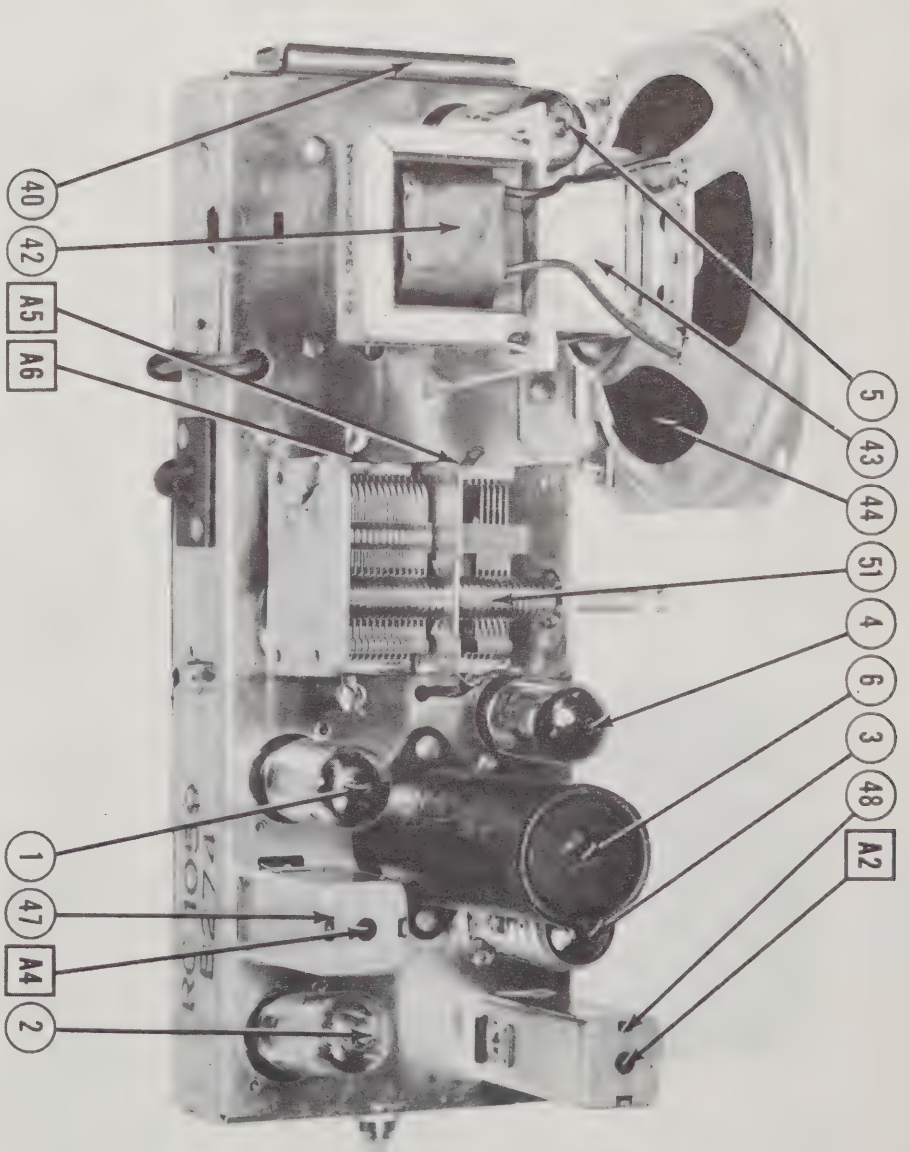
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: RCA PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 23A | 1 Meg. | ½ | 73125 | D13-137 | M-63-Z | Volume Control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 23A per instructions |
| C | Switch | | " " | 42 | SW-A2 | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: RCA PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 24 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Yl. Osc. Grid |
| 25 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red Filament String |
| 26 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red " " |
| 27 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | Yl.-Vi.-Grn. IF Grid |
| 28 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | Yl.-Vi.-Grn. AVC Network |
| 29 | 3.3 Meg. | ½ | | BTS-3.3 Meg. | Or.-Or.-Grn. " " |
| 30 | 39KΩ | ½ | | BTS-39K | Or.-White-Or. Conv. Screen Decoup. |
| 31 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. Diode Filter |
| 32 | 15 Meg. | ½ | | BTS-15 Meg. | Br.-Grn.-Blue AF Grid |
| 33 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | Yl.-Vi.-Grn. AF Screen |
| 34 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. AF Plate Load |
| 35 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. Output Grid |
| 36 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red Filament String |
| 37 | 1200Ω | ½ | | BTS-1200 | Br.-Red-Red Filament String |
| 38 | 2200Ω | 7 | 73132 | AB-2250 | Filament Dropping |
| 39 | 15KΩ | ½ | | BTS-15K | Br.-Grn.-Or. Filament Bleeder |
| 40 | 2200Ω | ½ | | BTS-2200 | Red-Red-Red Filter |
| 41 | 33Ω | | 73237 | | Rect. Ballast-See Note |

*Note-Special fuse type resistor order replacement from manufacturer.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | RCA PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 42 | 10KΩ | 3.8Ω | 400Ω | .4Ω | 71047 | A-3879 | T22S47 | A-2900 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | RCA PART No. | JENSEN PART No. | QUAM PART No. | |
| 43 | FIELD<br>PM | VC IMP.<br>3.8Ω | 73123 | ST-113<br>Mod. P4-X | 4A15 | |
| 44 | CONE DIA.<br>4" | VC DIA.<br>9/16" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | RCA PART No. | MEISSNER PART No. | |
| 45 | Loop Ant. | | 1.5Ω | 73141 | | |
| 46 | Osc. Coil | 2.0Ω | 8.5Ω | 73114 | | |
| 47 | Input IF | 20Ω | 20Ω | 73129 | 16-6668 | |
| 48 | Output IF | 16Ω | 16Ω | 73130 | | |

## BATTERIES

| ITEM No. | VOLTAGE | RCA PART No. | REPLACEMENT DATA | | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | EVEREADY | | | BURGESS | | | |
| | | | "A" | "B" | "A-B" | "A" | "B" | "A-B" | |
| 49 | 7.5V "A"<br>75V "B" | VS050 | | | | | | T5Z50 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | RCA PART No. | NOTES |
|---|---|---|---|
| 50 | Switch | 73133 | AC/DC-Batt. |
| 51 | 2 Gang Var. Cap. | 73126 | (14-106MMF, 16-483MMF) |
| | Knob | 73135 | Dial |
| | " | 73138 | Volume & On-Off |

TO REMOVE CARRYING HANDLE

1. Pull off the volume control knob.
2. Insert a small knife blade between one side of a spring clip and the cabinet, push upward on the slip shield to disengage the locking of the slip shield to the spring clip. Repeat this procedure on the other side of the spring clip. The slip shield may then be removed by pushing it upward thus disengaging it from the spring clip.
3. Repeat Step 2 for each slip shield.
4. Remove the four screws (2 on each side) which hold the carrying handle to the case. CAUTION: When re-assembling make certain that the slip shield and the spring clip is assembled with their locks in the correct relation to each other.

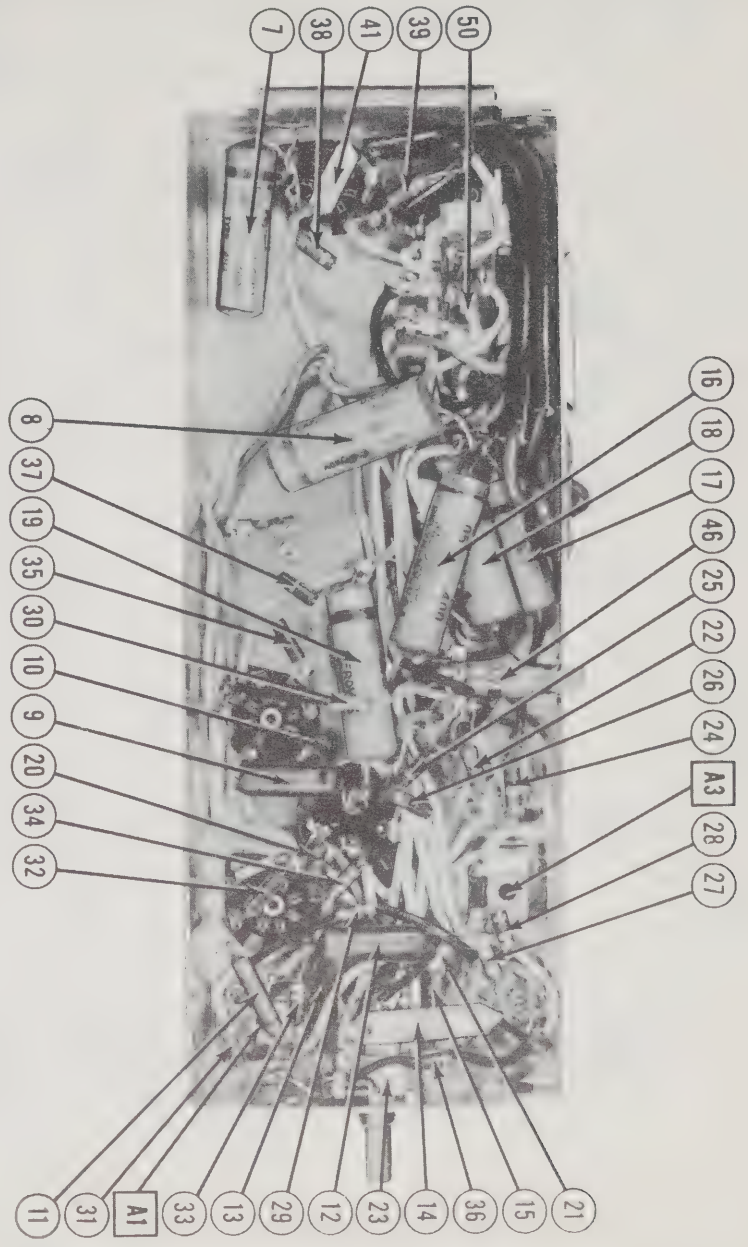
TO REMOVE CHASSIS

1. Pull off the volume control knob.
2. Close tuning condenser (dial at 55) to prevent possible damage to tuning condenser.
3. Remove dial knob by grasping both sides with the tips of the fingers of both hands and pull to the front - or - close the tuning condenser, open the back, reach in and push outward on the hub of the dial knob.
   NOTE: When re-assembling press inward on the back of the tuning condenser and on the front of the knob to properly seat the hub on the shaft.
4. Remove the two slip shields on the R.H. side of the cabinet (opposite the volume control) and unfasten the end of the carrying handle using the procedure described under, "To Remove Carrying Handle."
5. Unsolder the loop leads.
6. Remove the two screws holding the bottom edge of the speaker to the cabinet.
7. Remove the plug from the battery.
8. Remove the two screws at the top of the cabinet while supporting the chassis with one hand.
   NOTE: When re-installing replace speaker holding screws first but do not securely tighten until the two screws at the top of the cabinet have been tightened.

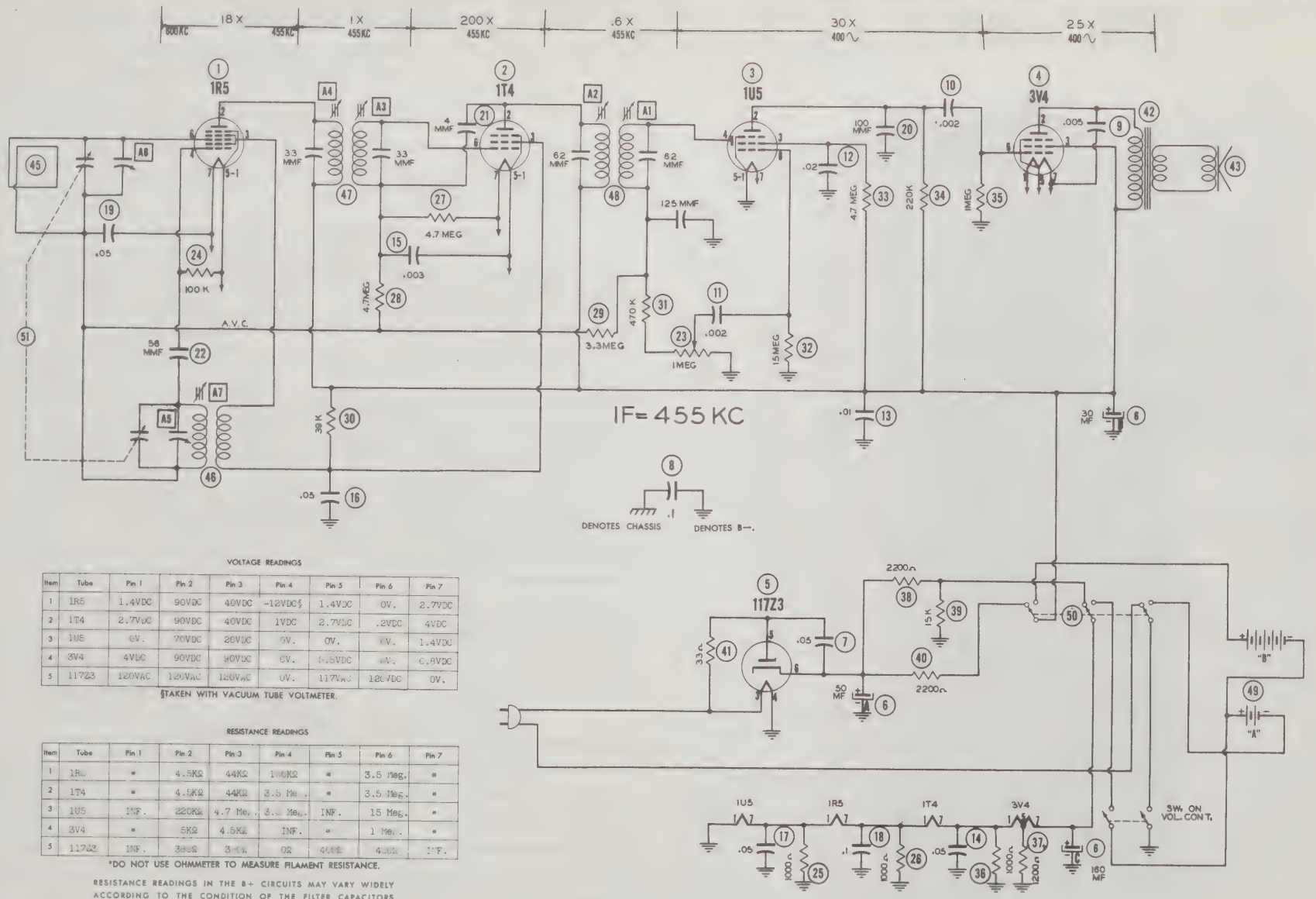


RCA (VICTOR) MODEL 8BX5

# CHASSIS—BOTTOM VIEW




RCA (VICTOR) MODEL 8BX5




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1R5 | 1.4VDC | 90VDC | 40VDC | -12VDC§ | 1.4VDC | 0V. | 2.7VDC |
| 2 | 1T4 | 2.7VDC | 90VDC | 40VDC | 1VDC | 2.7VDC | .2VDC | 4VDC |
| 3 | 1U5 | 0V. | 70VDC | 26VDC | 0V. | 0V. | 0V. | 1.4VDC |
| 4 | 3V4 | 4VDC | 90VDC | 90VDC | 0V. | 0.5VDC | 0V. | 0.8VDC |
| 5 | 117Z3 | 120VAC | 120VAC | 120VAC | 0V. | 117VAC | 120VDC | 0V. |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1R5 | * | 4.5KΩ | 44KΩ | 100KΩ | * | 3.5 Meg. | * |
| 2 | 1T4 | * | 4.5KΩ | 44KΩ | 3.5 Meg. | * | 3.5 Meg. | * |
| 3 | 1U5 | INF. | 220KΩ | 4.7 Meg. | 3.5 Meg. | INF. | 15 Meg. | * |
| 4 | 3V4 | * | 5KΩ | 4.5KΩ | INF. | * | 1 Meg. | * |
| 5 | 117Z3 | INF. | 350Ω | 350Ω | 0Ω | 400Ω | 450Ω | INF. |

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

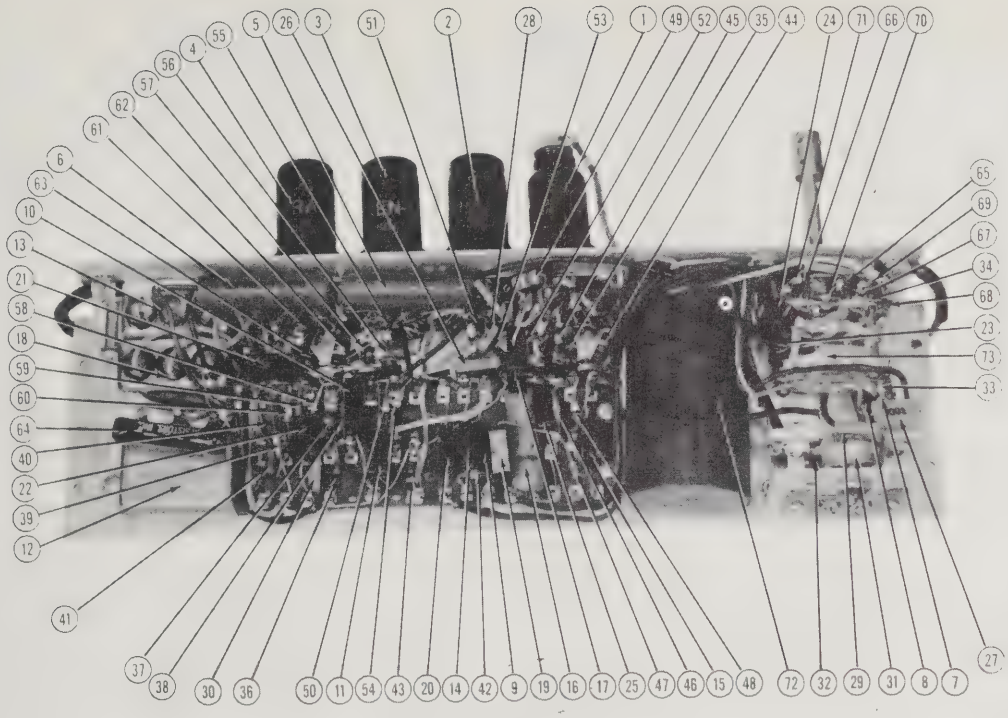
4816-20

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to B-.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volts.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

# SCOTT MUSIC AMPLIFIER, NOISE SUPPRESSOR

SCOTT MUSIC AMPLIFIER, NOISE SUPPRESSOR




SCOTT MUSIC CONTROL

| | |
|---|---|
| **TRADE NAME** | Scott, Music Control (Dynamic Noise Suppressor) |
| **MANUFACTURER** | Scott Radio Laboratories Inc., 4541 Ravenswood Ave., Chicago 40, Ill. |
| **TYPE SET** | Music Control Unit |
| **TUBES** (FOUR) | Types, 6B8 AF Amp., 6SG7 Capacitive Treble Gate, 6SG7 Inductive Treble Gate, 6SJ7 Low Frequency Gate. |

## INSTALLATION ADJUSTMENTS

The signal input level control Item #31 has been adjusted and sealed with soft wax at the laboratories. This adjustment has been made for average conditions and in most installations no readjustment will be necessary. However due to differences in room acoustics, power line voltages, listeners preference in reproduction and condition of recordings, it may be found necessary to reset the level of this control. The following procedure should be used.

The input signal level adjustment Item #31 is located at the rear of the unit and is accessible through the rear of the cabinet. This unit is provided to allow adjustment of the point at which operation of the suppressor starts.

The adjustment is made by setting the position of the control so that on a new record which has good fidelity, low scratch level and good dynamic range the following action will be noted.

1. Play the record at some spot where the reproduction is loud over a long continous musical passage. Under this condition the gates will open and when the control switch is turned from normal (center) to 2 right (maximum clockwise position) a slight increase in volume will be noted, with no change in reproduction of high or low frequencies.
2. Play the record at a spot where the reproduction is a low level and some scratch or rumble is noted in the background with the control switch in position normal (center). When the switch is turned to 2 Right (maximum clockwise position) no difference in audio level will be noted but the background scratch and rumble will cut out as the gates close.
3. If a swishing noise is heard when playing records with low level passages, the control switch should be turned to the next position as this swishing noise is an indicator that the gates are opening too quickly and the level of the music is not sustained long enough to cover up the background noise as the gates open and close. This "swishing" is most prominent on percussion instruments, such as piano and is due to the rapid change in volume levels with each successive note. The suppressor action (gating) is controlled by the level of the music and, if the control is advanced too far the gates will remain open on low level passages thus permitting scratch to be heard with the music. If the control is retarded too far the suppressor will not be effective, therefore if it is found necessary to change the adjustment after installation the best balance between scratch suppression and gating action should be obtained. The optimum setting allows full reproduction of all frequencies present on the high volume levels (gates open) and minimum amount of scratch and rumble on low passages (gates closed).
   It should be noted that when the gates close and scratch is suppressed, the lower audio frequencies are likewise suppressed. This action is normal and desirable since when music is recorded at low levels rumble and background noises are present in the reproduction and if not suppressed can be just as disturbing as the higher frequency scratch.

**HOWARD W. SAMS & CO., INC.** **Indianapolis , Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-21 SET #46-FOLDER #21

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: SCOTT PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | AF Amp. | 6B8 | 6B8 | 8E | |
| 2 | Capacitive Treble Gate | 6SG7 | 6SG7 | 8BK | |
| 3 | Inductive Treble Gate | 6SG7 | 6SG7 | 8BK | |
| 4 | Low Frequency Gate | 6SJ7 | 6SJ7 | 8N | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: SCOTT PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 5 | 25 | 25 | 15B795 | PRS25-25 | BR252A | M-25-25 | TA-25 | Bias Filter |
| 6 | 25 | 25 | 15B795 | PRS25-25 | BR252A | M-25-25 | TA-25 | Cathode Bypass |
| 7 | .001 | 600 | 15A35 | 684-001 | DT6D1 | ST-6-001 | TC-21 | Phono Coupling |
| 8 | .0005 | 600 | 15H2705 | 1467-0005 | DT6T5 | ST-6-0005 | TC-35 | " " |
| 9 | .001 | 600 | 15A35 | 684-001 | DT6D1 | ST-6-001 | TC-21 | Treble Diode Coupling |
| 10 | .005 | 600 | 15H2603 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Treble Diode Filter |
| 11 | .005 | 600 | 15H2603 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Treble Diode Filter |
| 12A | .25 | 600 | 15A425 | 630-.25-.25 | DYR6022 | XDMR6-2x.25 | BP-2256 | Music Amp. Screen Bypass |
| B | .25 | 600 | | | | | | RF Bypass Power Supply |
| 13A | .05 | 600 | 15A11 | 630-05-05 | DYR60055 | XDMR6-2x05 | BP-2056 | Bass Diode Filter |
| B | .05 | 600 | | | | | | " " " |
| 14 | .002 | 600 | 15H2602 | 684-002 | DT6D2 | ST-6-002 | TC-22 | Bass Diode Coupling |
| 15 | .001 | 600 | 15A35 | 684-001 | DT6D1 | ST-6-001 | TC-21 | Audio Coupling |
| 16 | .02 | 600 | 15E1001 | 684-02 | DT6S2 | ST-6-02 | TC-12 | " " |
| 17 | .005 | 600 | 15H2603 | 684-005 | DT6D5 | ST-6-005 | TC-25 | Audio Coupling |
| 18A | .05 | 600 | 15A11 | 630-05-05 | DYR60055 | XDMR6-2x05 | BP-2056 | Screen Bypass |
| B | .05 | 600 | | | | | | " " |
| 19 | .005 | 600 | 15H2603 | 684-005 | DT6D5 | ST-6-005 | TC-25 | DC Blocking |
| 20 | .002 | 600 | 15H2602 | 684-002 | DT6D2 | ST-6-002 | TC-22 | Phase Shift Cap. |
| 21 | .005 | 600 | 15H2603 | 684-005 | DT6D5 | ST-6-005 | TC-25 | DC Blocking |
| 22 | .0005 | 600 | 15H2705 | 1467-0005 | DT6T5 | ST-6-0005 | TC-35 | Phase Shift Cap. |
| 23 | .001 | 600 | 15A35 | 684-001 | DT6D1 | ST-6-001 | TC-21 | Tone Compensation |
| 24 | .002 | 600 | 15H2602 | 684-002 | DT6D2 | ST-6-002 | TC-22 | " " |
| 25 | .001 | 600 | 15A35 | 684-001 | DT6D1 | ST-6-001 | TC-21 | " " |
| 26 | 240 | 500 | | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | Bass Diode Filter |
| 27 | 100 | 500 | 15A29 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Fixed Trimmer |
| 28 | 100 | 500 | 15A29 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Phase Shift Cap. |
| 29 | 240 | 500 | | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | Tone Compensation |
| 30 | 240 | 500 | | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | Phase Shift Cap. |

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SCOTT PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 31 | 1 Meg. | ½ | 70H2613 | | | Volume Control |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SCOTT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 32 | 47KΩ | ½ | 70A61 | BTS-470K | Yl.-Vi.-Yl. Phono Shunt |
| 33 | 330KΩ | ½ | 70H2615 | BTS-330K | Or.-Or.-Yl. Phono Tone Compensation |
| 34 | 240KΩ | ½ | | BTS-220K | Red-Yl.-Yl. Phono Tone Compensation |
| 35 | 100Ω | ½ | | BW-½-100 | Br.-Blk.-Br. Music Amp. Cathode |
| 36 | 20 Meg. | ½ | 70H2709 | BTS-22 Meg. | Red-Blk.-Blue Treble Diode Load |
| 37 | 470KΩ | ½ | 70A61 | BTS-470K | Yl.-Vi.-Yl. Treble Diode Filter |
| 38 | 1 Meg. | ½ | 70A63 | BTS-1 Meg. | Br.-Blk.-Grn. Treble Diode Filter |
| 39 | 1.5 Meg. | ½ | 70B846 | BTS-1.5 Meg. | Br.-Grn.-Grn. Bass Diode Load |
| 40 | 1 Meg. | ½ | 70A63 | BTS-1 Meg. | Br.-Blk.-Grn. Bass Diode Filter |
| 41 | 1 Meg. | ½ | 70A63 | BTS-1 Meg. | Br.-Blk.-Grn. Bass Diode Filter |
| 42 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. Bass Diode Coupling |
| 43 | 2400Ω | ½ | 70A49 | BTS-2200 | Red-Yl.-Red Noise Suppressor Cathode |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SCOTT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 44 | 75KΩ | ½ | | BTS-82K | Vi.-Grn.-Or. Bleeder-See Note |
| 45 | 560KΩ | ½ | | BTS-560K | Grn.-Blue-Yl. Music Amp. Screen Dropping |
| 46 | 160KΩ | ½ | | BTS-150K | Br.-Blue-Yl. Music Amp. Plate Load |
| 47 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Music Amp. Plate Load |
| 48 | 100KΩ | ½ | 70A58 | BTS-100K | Br.-Blk.-Yl. Tone Compensation |
| 49 | 470KΩ | ½ | 70A61 | BTS-470K | Yl.-Vi.-Yl. " " |
| 50 | 100KΩ | ½ | 70A58 | BTS-100K | Br.-Blk.-Yl. Cap. Treble Gate Grid |
| 51 | 22KΩ | ½ | 70H2708 | BTS-22K | Red-Red-Or. Bleeder |
| 52 | 100KΩ | 1 | 70A65 | BTA-100K | Br.-Blk.-Yl. Cap. Treble Gate Screen Dropping |
| 53 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. Cap. Treble Gate Plate Load |
| 54 | 100KΩ | ½ | 70A58 | BTS-100K | Br.-Blk.-Yl. Ind. Treble Gate Grid |
| 55 | 22KΩ | ½ | 70H2708 | BTS-22K | Red-Red-Or. Bleeder |
| 56 | 100KΩ | 1 | 70A65 | BTA-100K | Br.-Blk.-Yl. Ind. Treble Gate Screen Dropping |
| 57 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. Ind. Treble Gate Plate Load |
| 58 | 5.6 Meg. | ½ | | BTS-5.6 Meg. | Grn.-Blue-Grn. Phase Shifter |
| 59 | 1 Meg. | ½ | 70A63 | BTS-1 Meg. | Br.-Blk.-Grn. " " |
| 60 | 330KΩ | ½ | 70H2615 | BTS-330K | Or.-Or.-Yl. Bass Gate Grid |
| 61 | 10KΩ | ½ | 70A419 | BTS-10K | Br.-Blk.-Or. Bleeder |
| 62 | 100KΩ | 1 | 70A65 | BTA-100K | Br.-Blk.-Yl. Bass Gate Screen Dropping |
| 63 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. Bass Gate Plate Load |
| 64 | 3000Ω | 10 | 70B681 | AB-3000 | Decoupling |
| 65 | 1 Meg. | ½ | 70A63 | BTS-1 Meg. | Br.-Blk.-Grn. Tone Compensation |
| 66 | 2.2 Meg. | ½ | 70A64 | BTS-2.2 Meg. | Red-Red-Grn. " " |
| 67 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. " " |
| 68 | 330KΩ | ½ | 70H2615 | BTS-330K | Or.-Or.-Yl. " " |
| 69 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. " " |
| 70 | 220KΩ | ½ | 70A59 | BTS-220K | Red-Red-Yl. " " |
| 71 | 100KΩ | ½ | 70A58 | BTS-100K | Br.-Blk.-Yl. " " |

Note-Sets with serial numbers less than #80 use 120KΩ in this application.

## TONE CHOKE

| ITEM NO. | RATINGS: TOTAL DIRECT CURRENT | RATINGS: D. C. RESISTANCE | RATINGS: INDUCTANCE (0 CURRENT 1000~) | REPLACEMENT DATA: SCOTT PART NO. | STANCOR PART NO. | THORDARSON PART NO. | MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 72A | | 275Ω | 1.3 Henries | 17H2701 | | | | |
| B | | 80Ω | .4 Henries | | | | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | SCOTT PART No. | NOTES |
|---|---|---|---|
| 73 | Switch | 89E1292-1 | Selector |

TEST PROCEDURE

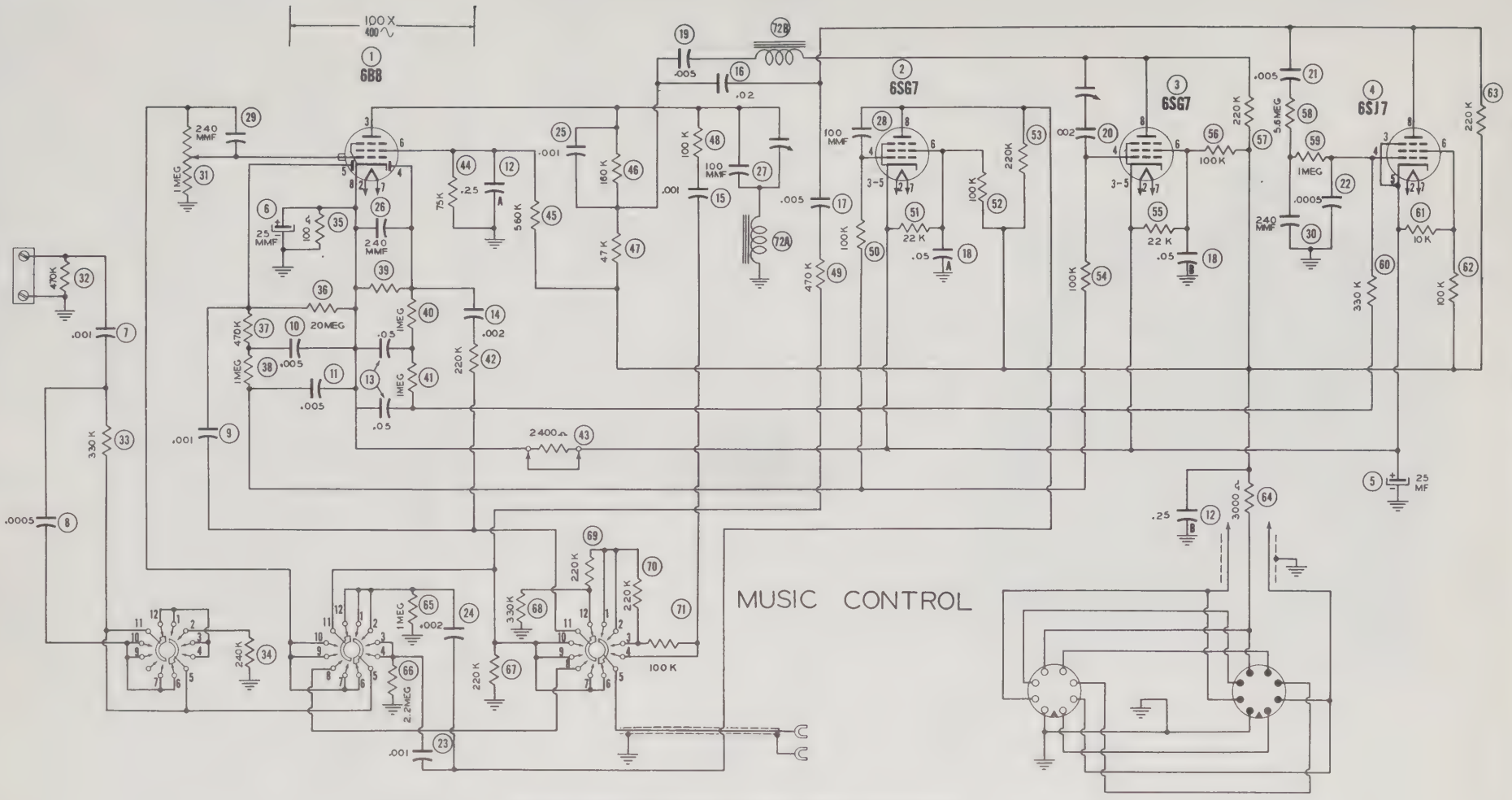
General

Because of the variations in audio response which may be incurred, due to the setting of the tone controls on the radio receiver, the following test procedure for the suppressor unit is made without the audio circuits of the radio receiver to enable a definite check to be made of the suppressor unit circuits. To make the necessary tests a DC vacuum tube voltmeter will be required for voltage measurements in order that the circuits are not loaded and give a false reading. For audio signal measurement, a high impedance AC voltmeter capable of reading voltages as low as a .004 volts must be used.

The suppressor unit should be removed from the cabinet leaving the adapter cable plugged into the power supply in order to obtain the necessary operating voltages. The cover of the suppressor unit should be removed. Localizing trouble can often be quickly accomplished by operating the suppressor unit under normal conditions using a record which as both high and low level passages and reading the plate voltages on tubes Item numbers 2, 3 and 4 with a DC vacuum tube voltmeter. With the control switch set on position 2 Right, 1 Left, 2 Left and with a high level passage being reproduced, the plate voltage on 2, 3 and 4 should be the same as the plus B supply voltage indicating that the tubes are not drawing plate current which is normal with the gates open. The bass gate tube Item 4 and treble gate tubes Items 2 and 3 have different delay characteristics, the treble gate tubes react very quickly to a change in dynamic range so that the gates should open before the meter will read maximum when checking the plate voltage. A good check of this condition can be made using a record having fairly low level passages with a sudden crash of cymbals. The bass gate tuning is much slower and a fairly long, high level passage is necessary before the gate will open and full plate voltage result. On a low level passage where both the bass and treble gates are closed the plate readings should be approximately 30 to 120 volts depending upon the position of the control switch and the level of the passage being reproduced.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.

4 - 325 volts DC on Pin 4 and 6.6 volts AC between Pins 2 and 7 maintained at adaptor socket for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Selector switch at maximum counter-clockwise position, no signal applied for voltage measurements.




VOLTAGE AND RESISTANCE READINGS TAKEN IN MAXIMUM COUNTER-CLOCKWISE POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6B8 | 0V. | 3.5VAC | 105VDC | 0V. | 0V. | 24VDC | 3.5VAC | 1VDC |
| 2 | 6SG7 | 0V. | 3.5VAC | 1VDC | 0V. | 1VDC | 42VDC | 3.5VAC | 40VDC |
| 3 | 6SG7 | 0V. | 3.5VAC | 1VDC | 0V. | 1VDC | 45VDC | 3.5VAC | 37VDC |
| 4 | 6SJ7 | 0V. | 3.5VAC | 1VDC | 0V. | 1VDC | 27VDC | 3.5VAC | 111VDC |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6B8 | 0Ω | .05Ω | 225KΩ | 1.5 Meg. | 20 Meg. | 60KΩ | .05Ω | 100Ω |
| 2 | 6SG7 | 0Ω | .05Ω | 100Ω | 20 Meg. | 100Ω | 18KΩ | .05Ω | 245KΩ |
| 3 | 6SG7 | 0Ω | .05Ω | 100Ω | 20 Meg. | 100Ω | 18KΩ | .05Ω | 245KΩ |
| 4 | 6SJ7 | 0Ω | .05Ω | 100Ω | 4 Meg. | 100Ω | 5KΩ | .05Ω | 245KΩ |

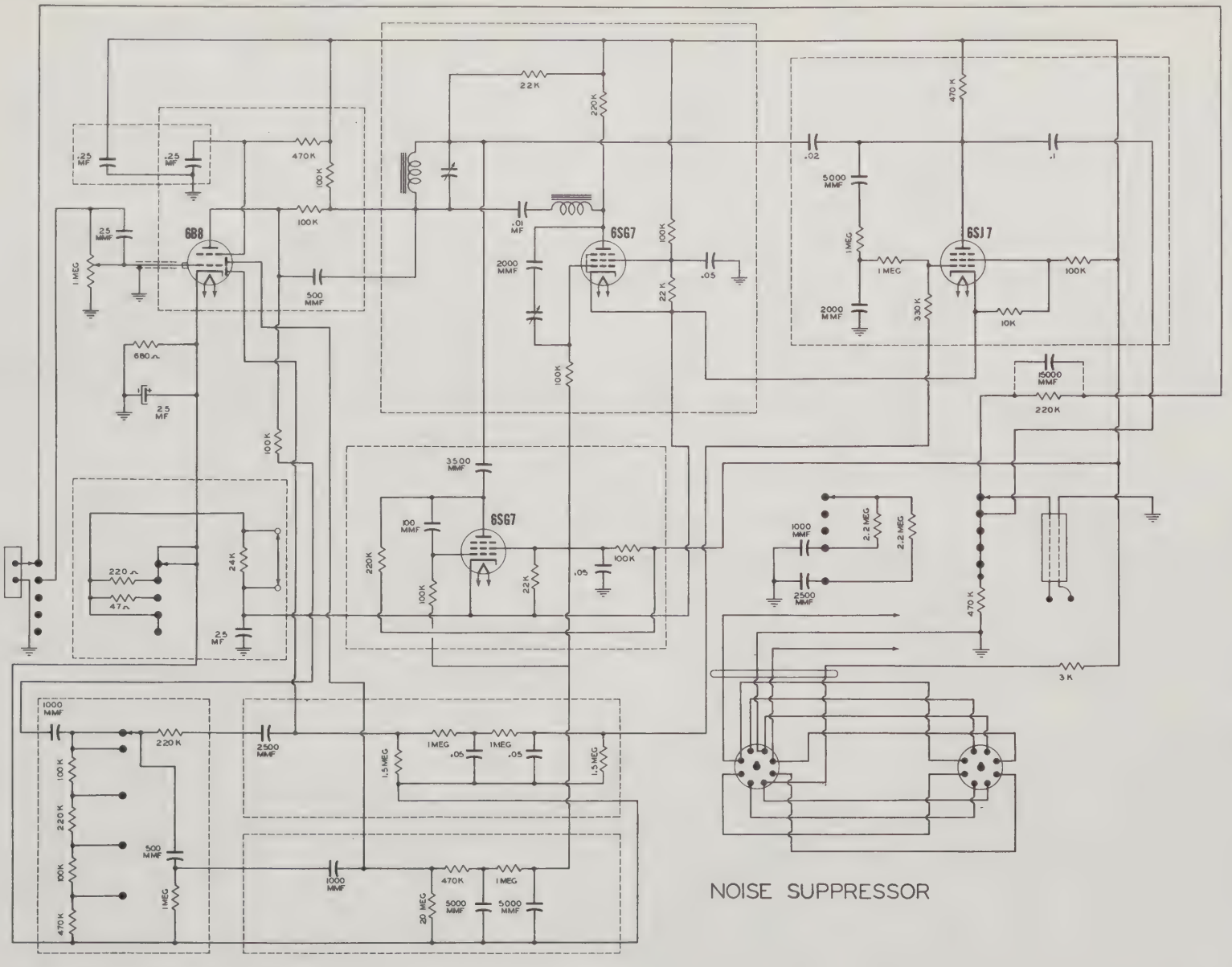
THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

4816-21

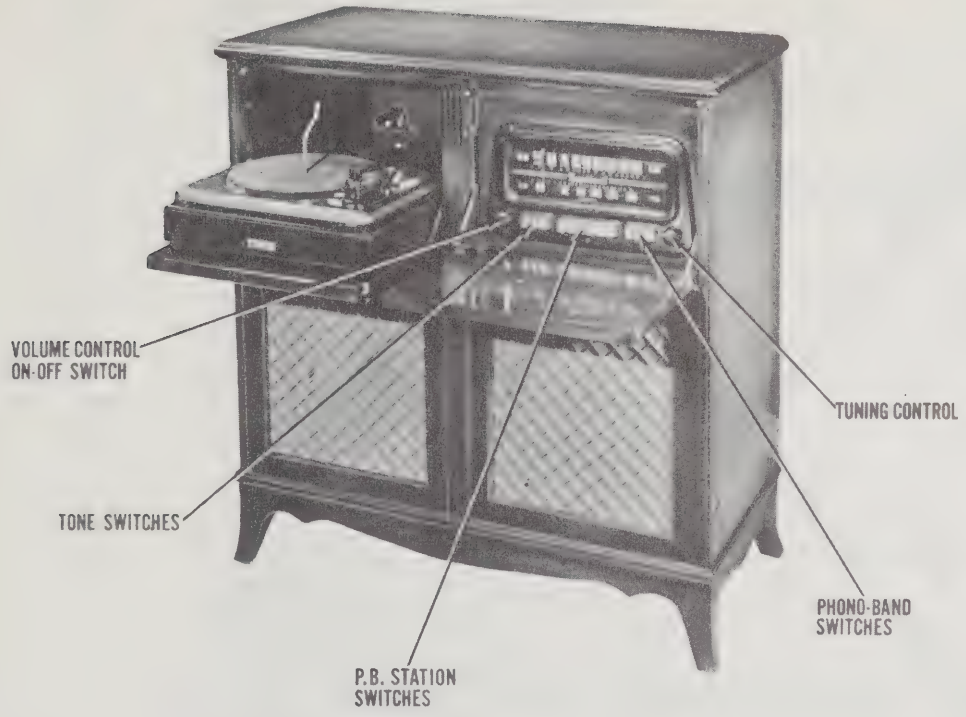



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

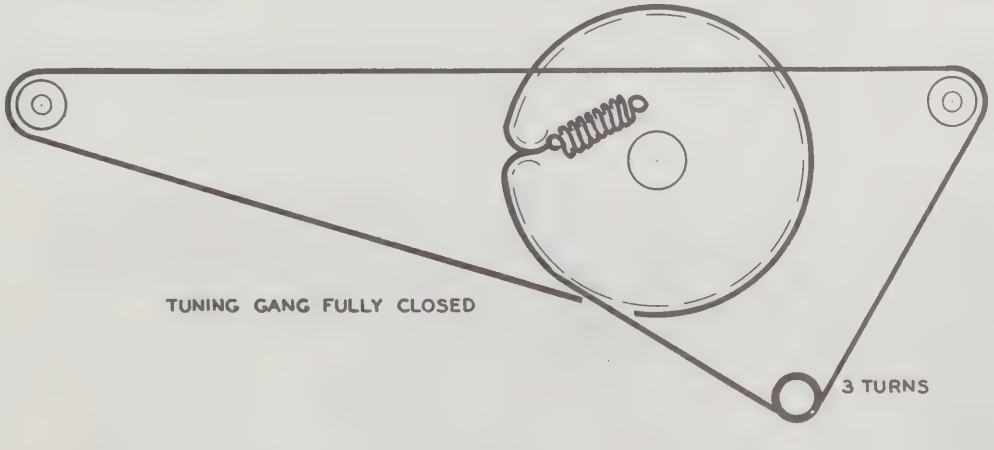
4816-21

SENTINEL MODELS
296B, 296M




SENTINEL MODEL 296-M

| | |
|---|---|
| TRADE NAME | Sentinel, Models 296-B, 296-M |
| MANUFACTURER | Sentinel Radio Corp., 2100 W. Dempster St., Evanston, Ill. |
| TYPE SET | AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna. |
| TUBES (TEN) | Types, 6BA6 FM RF Amp., 7F8 FM Conv., 6BA6 AF RF Amp., 6BA6 FM IF Amp., 6BA6 AM-FM IF Amp., 6AU6 Limiter, 6S8GT Disc.-Det.-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 110-120 Volts AC |
| RATING | .85 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 530-1730KC FREQ. MOD. 87.5-109MC |



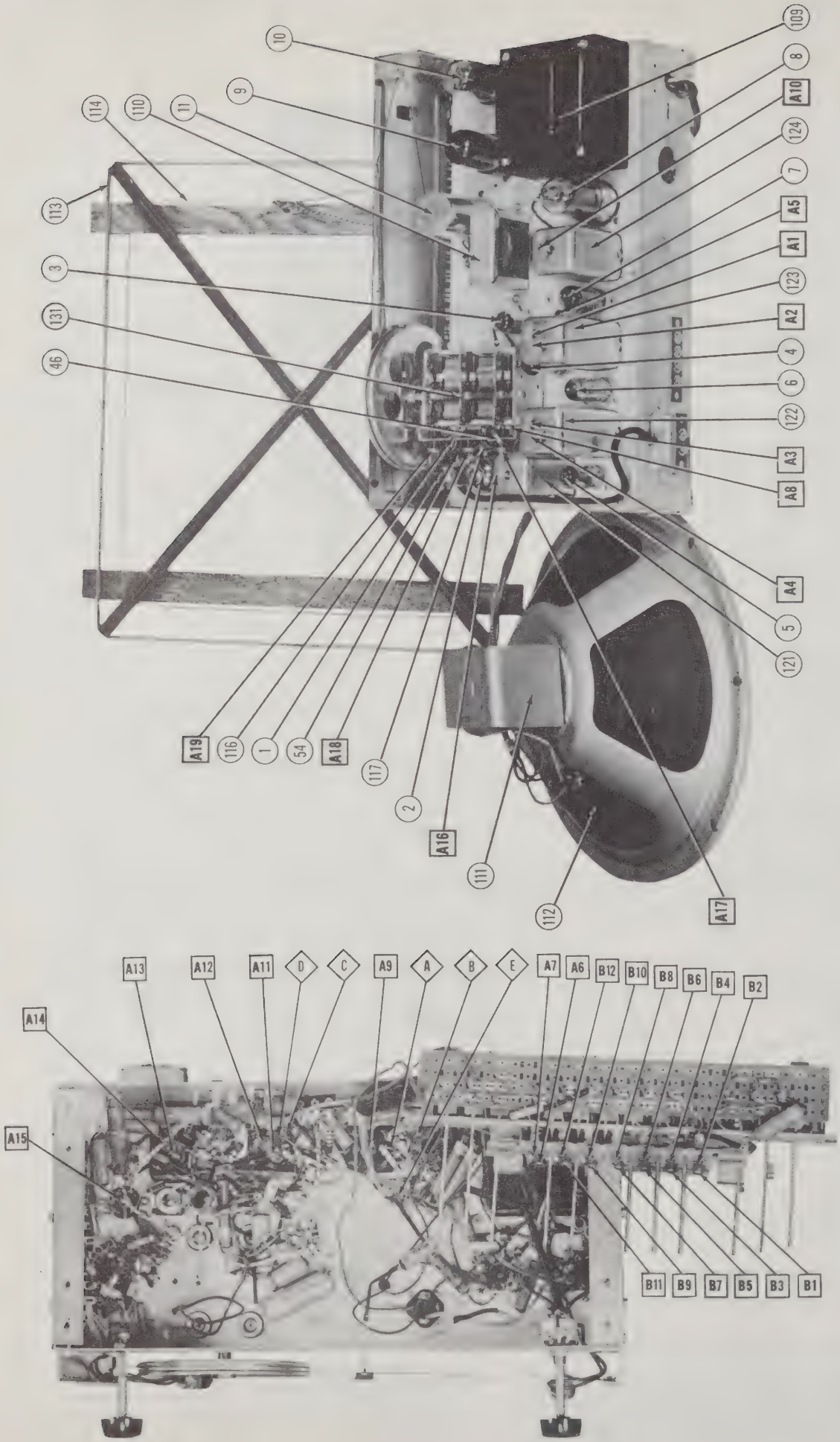

DIAL CORD DRIVE

SENTINEL MODELS
296B, 296M

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 9/48-#4816-22 SET #46-FOLDER #22


10
9
114
110
11
113
3
131
46
109
8
A10
124
7
A5
A1
123
A2
4
6
122
A3
A8
A4
5
121
A19
116
1
54
A18
117
2
A16
111
112
A17
A13
A12
A11
D
C
A9
A
B
E
A7
A6
B12
B10
B8
B6
B4
B2
A14
A15
B11
B9
B7
B5
B3
B1

16
104
130
103
57
59
58
108
60
107
36
101
98
20
38
21
95
92
40
91
89
87
96
88
63
86
23
35
83
24
84
25
22
82
81
27
26
75
80
115
43
28
29
78
48
44
47
76
77
49
66
79
65
30
126
125
52
51
45
50
62
64
53
120
119
85
72
74
129
32
71
55
68
69
33
118
56
34
41
73
70
31
67
90
93
39
94
15
42
99
97
100
19
105
18
17
102
37
128
14
61
106
12
13

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | FM RF Amp. | 6BA6 | 6BA6 | 7BK | |
| 2 | FM Conv. | 7F8 | 7F8 | 8BW | |
| 3 | AM RF Amp. | 6BA6 | 6BA6 | 7BK | |
| 4 | AM Conv. | 6BE6 | 6BE6 | 7CH | |
| 5 | FM IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 6 | AM-FM IF Amp. | 6BA6 | 6BA6 | 7BK | |
| 7 | Limiter | 6AU6 | 6AU6 | 7BK | |
| 8 | Disc.-Det.-AVC-AF | 6S8GT | 6S8GT | 8CB | |
| 9 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 10 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: SOLAR PART No. | REPLACEMENT DATA: SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 11A | 40 | 400 | 25E20 | AF444J4A* | UP4245 | DY-3x20-450* | EL-240 | ▲ Filter |
| B | 20 | 400 | | | | | | ▲ " |
| 12 | .01 | 220V AC | 25E250 | 684-01 | DT6S1 | MPH-6-01 | TC-11 | Line Filter |
| 13 | .01 | 220V AC | 25E250 | 684-01 | DT6S1 | MPH-6-01 | TC-11 | " " |
| 14 | .002 | 600 | 23E605 | 684-002 | DT6D2 | ST-6-002 | TC-22 | Output Plate Bypass |
| 15 | .001 | 200 | 23E204 | 484-001 | DT6D1 | ST-6-001 | TC-21 | Tone Compensation |
| 16 | .005 | 200 | 23E208 | 484-005 | DT6D5 | ST-6-005 | TC-25 | " " |
| 17 | .02 | 400 | 23E413 | 484-02 | DT4S2 | ST-4-02 | TC-12 | Audio Coupling |
| 18 | .02 | 200 | 23E213 | 484-02 | DT4S2 | ST-4-02 | TC-12 | " " |
| 19 | .001 | 600 | 23E204 | 684-001 | DT6D1 | ST-6-001 | TC-21 | De-emphasis |
| 20 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Limiter Plate Decoup. |
| 21 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Limiter Screen Bypass |
| 22 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | IF Plate Decoup. |
| 23 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | IF Screen Bypass |
| 24 | .05 | 200 | 23E416 | 484-05 | DT4S5 | ST-4-05 | TC-15 | IF Cathode |
| 25 | .05 | 200 | 23E416 | 484-05 | DT4S5 | ST-4-05 | TC-15 | AVC Filter |
| 26 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | FM IF Plate Decoup. |
| 27 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | FM IF Screen Bypass |
| 28 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | AVC Filter |
| 29 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Conv. Plate Decoup. |
| 30 | .01 | 400 | 23E411 | 484-01 | DT4S1 | ST-4-01 | TC-11 | FM Conv. Cathode Bypass |
| 31 | .25 | 400 | 23E422 | 484-.25 | DT4P25 | ST-4-25 | TC-2 | RF Bypass Pwr. Supply |
| 32 | .05 | 400 | 23E416 | 484-05 | DT4S1 | ST-4-05 | TC-15 | AM Conv. Screen Bypass |
| 33 | .05 | 400 | 23E416 | 484-05 | DT4S1 | ST-4-05 | TC-15 | AM RF Screen Bypass |
| 34 | .2 | 200 | 23E214-10 | 484-.2 | DT4P2 | ST-4-2 | TC-2 | AM RF Cathode Bypass |
| 35 | .05 | 400 | 23E416 | 484-05 | DT4S5 | ST-4-05 | TC-15 | AVC Filter |
| 36 | 250 | 500 | 23E42 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | AF Plate Bypass |
| 37 | 100 | 500 | 23E11 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Tone Compensation-Cer. |
| 38 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | RF Bypass-Cer. |
| 39 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | " " " |
| 40 | 25 | 500 | 23E8 | 1468-000025 | 5W5Q25 | MO.5-425 | MS-425 | Limiter Grid Filter-Cer. |
| 41 | 100 | 500 | 23E11 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Diode RF Filter-Cer. |
| 42 | 100 | 500 | 23E11 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | " " " " |
| 43 | 3 | 500 | 23E13 | | | | | IF Grid Bypass-Cer. |
| 44 | 1000 | 500 | 23E2012 | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | AVC Filter-Cer. |
| 45 | 1000 | 500 | 23E2012 | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | Conv. Cathode Byp.-Cer. |
| 46 | 3 | 500 | 23E13 | | | | | Fixed Trimmer-See Note-Cer. |
| 47 | 1000 | 500 | 23E2012 | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | Osc. Plate Bypass-Cer. |
| 48 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Osc. Grid Cap.-Cer. |
| 49 | 3 | 500 | 23E13 | | | | | Osc. Coupling-Cer. |
| 50 | 25 | 500 | 23E8 | 1468-000025 | 5W5Q25 | MO.5-425 | MS-425 | RF Coupling-Cer. |
| 51 | 1000 | 500 | 23E2012 | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | FM RF Plate Decoup.-Cer. |
| 52 | 1000 | 500 | 23E2012 | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | FM RF Screen Byp.-Cer. |
| 53 | 1000 | 500 | 23E2012 | 1468-001 | 1W5D1 | MO.5-21 | 1FM-21 | FM RF Cathode Byp.-Cer. |
| 54 | 100 | 500 | 23E11 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | RF Coupling-Cer. |
| 55 | 100 | 500 | 23E11 | 1468-0001 | 5W5T1 | MO.5-31 | 1FM-31 | Osc. Grid Cap.-Cer. |
| 56 | 250 | 500 | 23E42 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | RF Coupling |
| 57 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Fixed Trimmer-Cer. |

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDARSON PART No. | REPLACEMENT DATA: MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 109 | 117V AC @ .85A | 680V CT .114A DC | 5.0V AC @ 2.0A | 6.4V AC @ 3.6A | 22E19 | P-6013 | T22R05 | P-2953 |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: THORDAR'N PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 110 | 4300Ω | 3.9Ω | 290Ω | .4Ω | 22E18 | A-3825 | T22S60 | A2902‡ | ‡Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: JENSEN PART No. | REPLACEMENT DATA: QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD | VC IMP. | | ST-744 | | †Replace output transformer to |
| 111 | 1700Ω | 3.8Ω | 1E24 | Mod. F10-S | 12E10† | match 6-8Ω voice coil. |
| | CONE DIA. | VC DIA. | | | | |
| 112 | 11½" | 1" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: MEISSNER PART No. |
|---|---|---|---|---|---|
| 113 | Loop Ant. | | .3Ω | 20E235 | |
| 114 | FM Dipole | | | 20E236 | |
| 115 | Loop Load. Coil | | 1.5Ω | 20E222 | |
| 116 | FM Ant.Coil | | 0Ω | 2E48 | |
| 117 | FM RF Coil | | 0Ω | 2E49 | |
| 118 | Wave Trap | | 55Ω | 2E19 | |
| 119 | BC Osc.Coil | .7Ω | 5.7Ω | 20E221 | 14-1060 |
| 120 | FM Osc. " | | 0Ω | 2E50 | |
| 121 | FM 1st IF | .3Ω | .3Ω | 20E218 | |
| 122A | AM 1st IF | 4Ω | 4.5Ω | 20E216 | |
| B | FM 2nd IF | .4Ω | .4Ω | | |
| 123A | AM 2nd IF | 7Ω | 7Ω | 20E217 | |
| B | FM 3rd IF | .4Ω | .4Ω | | |
| 124 | FM Disc. | .4Ω | .4Ω | 20E219 | |
| 125 | FM Plate Choke | | .1Ω | 2E52 | |
| 126 | RF Choke | | .2Ω | 2E47 | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA: SENTINEL PART No. | REPLACEMENT DATA: ASTATIC PART No. | REMARKS |
|---|---|---|---|
| 127 | | QT3-M | QT-M Original Part |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA: SENTINEL PART No. | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| 127 | Bayonet | 6-8 | 0.25 | Blue | 40E2 | | Type 44 |
| 128 | " | " | " | " | " | | " |

## MISCELLANEOUS

| ITEM No. | PART NAME | SENTINEL PART No. | NOTES |
|---|---|---|---|
| 129 | Switch | 29E14 | Pushbutton |
| 130 | Tuning Gang | 24E27 | AM (15-518MMF, 15-518MMF) |
| A5 | Trimmer | 24E3 | AM Wave Trap Adj. |
| A8 | Padder | 24E16 | AM Osc. Adj. |
| | Trimmer Strip | 24E26 | A6, B1, B3, B5, B7, B9, B11 |
| | " " | 24E25 | A7, B2, B4, B6, B8, B10, B12 |
| A17 | Trimmer | 24E28 | FM Osc. Adj. |
| A18 | " | 24E28 | FM RF Adj. |
| A19 | " | 24E28 | FM Ant. Adj. |
| | Dial Pointer | 20E174-4 | |
| | Dial Scale | 36E29-2 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | SENTINEL PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 58 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | Fixed Trimmer-Cer. |
| 59 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | " " " |
| 60 | 51 | 500 | 23E2 | 1468-00005 | 5W5Q5 | MO.5-45 | 1FM-45 | " " " |

*-Parallel sections to obtain desired capacity.
Note-Not used in all models.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | SENTINEL PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 61A | 2 Meg. | | 28E21 | D18-139X | AT-116 | Volume Control tapped @ 1 Meg. |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 61A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | SENTINEL PART No. | IRC PART No. | |
| 62 | 1 Meg. | ½ | 27E105-2 | BTS-1 Meg. | Br.-Blk.-Grn. FM RF Grid |
| 63 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 64 | 68Ω | ½ | 27E680-2 | | Blue-Gray-Blk. FM RF Cathode |
| 65 | 39KΩ | ½ | 27E393-2 | BTS-39K | Or.-White-Or. FM RF Screen Dropping |
| 66 | 2200Ω | ½ | 27E222-2 | BTS-2200 | Red-Red-Red FM RF Plate Decoupling |
| 67 | 68Ω | ½ | 27E680-2 | BW-½-68 | Blue-Gray-Blk. AM RF Cathode |
| 68 | 39KΩ | ½ | 27E393-2 | BTS-39K | Or.-White-Or. AM RF Screen Dropping |
| 69 | 8200Ω | 1 | 27E822-3 | BTA-8200 | Gray-Red-Red AM RF Plate Load |
| 70 | 1 Meg. | ½ | 27E105-2 | BTS-1 Meg. | Br.-Blk.-Grn. AM Converter Grid |
| 71 | 22KΩ | ½ | 27E223-2 | BTS-22K | Red-Red-Or. AM Oscillator Grid |
| 72 | 1000Ω | ½ | 27E102-2 | BTS-1000 | Br.-Blk.-Red Parasitic Suppressor |
| 73 | 2.2 Meg. | ½ | 27E225-2 | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 74 | 22KΩ | 2 | 27E223-5 | BT-2-22K | Red-Red-Or. AM Converter Screen Dropping |
| 75 | 2200Ω | ½ | 27E222-2 | BTS-2200 | Red-Red-Red FM Converter Plate Decoupling |
| 76 | 22KΩ | ½ | 27E223-2 | BTS-22K | Red-Red-Or. FM Oscillator Grid |
| 77 | 10KΩ | 1 | 27E103-3 | BTA-10K | Br.-Blk.-Or. FM Oscillator Plate Load |
| 78 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. AVC Network |
| 79 | 1500Ω | ½ | 27E152-2 | BTS-1500 | Br.-Grn.-Red FM Converter Cathode |
| 80 | 47Ω | ½ | 27E470-2 | | Yl.-Vi.-Blk. 1st IF Cathode |
| 81 | 39KΩ | ½ | 27E393-2 | BTS-39K | Or.-White-Or. 1st IF Screen Dropping |
| 82 | 2200Ω | ½ | 27E222-2 | BTS-2200 | Red-Red-Red 1st IF Plate Decoupling |
| 83 | 68Ω | ½ | 27E680-2 | | Blue-Gray-Blk. 2nd IF Cathode |
| 84 | 39KΩ | ½ | 27E393-2 | BTS-39K | Or.-White-Or. 2nd IF Screen Dropping |
| 85 | 2200Ω | ½ | 27E222-2 | BTS-2200 | Red-Red-Red 2nd IF Plate Decoupling |
| 86 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. 3rd FM IF Transformer Shunt |
| 87 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. 3rd FM IF Transformer Shunt |
| 88 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. Limiter Grid |
| 89 | 1 Meg. | ½ | 27E105-2 | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 90 | 15KΩ | ½ | 27E153-2 | BTS-15K | Br.-Grn.-Or. Bleeder |
| 91 | 43KΩ | 1 | 27E473-3 | BTA-47K | Yl.-Or.-Or. Limiter Screen Dropping |
| 92 | 1 Meg. | ½ | 27E105-2 | BTS-1 Meg. | Br.-Blk.-Grn. AVC Network |
| 93 | 47KΩ | ½ | 27E473-2 | BTS-47K | Yl.-Vi.-Or. Diode RF Filter |
| 94 | 330KΩ | ½ | 27E334-2 | BTS-330K | Or.-Or.-Yl. Diode Load |
| 95 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. Limiter Plate Decoupling |
| 96 | 470KΩ | ½ | 27E474-2 | BTS-470K | Yl.-Vi.-Yl. Phono Shunt |
| 97 | 32KΩ | ½ | 27E323-2 | BTS-32K | Gray-Red-Or. De-emphasis |
| 98 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. Discriminator Diode Load |
| 99 | 100KΩ | ½ | 27E104-2 | BTS-100K | Br.-Blk.-Yl. " " " |
| 100 | 10 Meg. | ½ | 27E106-2 | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 101 | 220KΩ | ½ | 27E224-2 | BTS-220K | Red-Red-Yl. AF Plate Load |
| 102 | 47KΩ | ½ | 27E473-2 | BTS-47K | Yl.-Vi.-Or. Tone Compensation |
| 103 | 220KΩ | ½ | 27E224-2 | BTS-220K | Red-Red-Yl. " " |
| 104 | 220KΩ | ½ | 27E224-2 | BTS-220K | Red-Red-Yl. " " |
| 105 | 470KΩ | ½ | 27E474-2 | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 106 | 270Ω | 1 | 27E271-3 | BW-1-270 | Red-Vi.-Br. Output Cathode |
| 107 | 100KΩ | 2 | 27E104-5 | BT-2-100K | Br.-Blk.-Yl. Bleeder |
| 108 | 100KΩ | 2 | 27E104-5 | BT-2-100K | Br.-Blk.-Yl. " |

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

| | Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ‡ | 1 | 6BA6 | 0V. | 0V. | 6.4VAC | 0V. | 225VDC | 115VDC | 1VDC | - | - |
| ‡ | 2 | 7F8 | 0V. | 6.2VAC | 240VDC | 5.5VDC | 0V. | 162VDC | 0V. | -1.5VDC§ | - |
| | 3 | 6BA6 | 0V. | 0V. | 6.4VAC | 0V. | 182VDC | 98VDC | .9VDC | - | - |
| | 4 | 6BE6 | -11VDC§ | 0V. | 6.4VAC | 0V. | 260VDC | 82VDC | 0V. | - | - |
| ‡ | 5 | 6BA6 | -.2VDC | 0V. | 6.4VAC | 0V. | 232VDC | 100VDC | .5VDC | - | - |
| | 6 | 6BA6 | -.2VDC | 0V. | 6.4VAC | 0V. | 230VDC | 110VDC | 1VDC | - | - |
| ‡ | 7 | 6AU6 | -.3VDC | 0V. | 6.4VAC | 0V. | 35VDC | 52VDC | 0V. | - | - |
| | 8 | 6S8GT | -.6VDC | 0V. | -.6VDC | -.6VDC | -.2VDC | 117VDC | 6.4VAC | 0V. | -.6VDC |
| | 9 | 6V6GT | 0V. | 0V. | 240VDC | 250VDC | 0V. | 0V. | 6.4VAC | 22VDC | - |
| | 10 | 5Y3GT | 0V. | 350VDC | 0V. | 340VAC | 0V. | 340VAC | 0V. | 350VDC | - |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| | Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ‡ | 1 | 6BA6 | 1.5 Meg. | 0Ω | .1Ω | 0Ω | 25KΩ | 55KΩ | 68Ω | - | - |
| ‡ | 2 | 7F8 | 0Ω | .3Ω | 25KΩ | 1.5KΩ | 0Ω | 30KΩ | 0Ω | 22KΩ | - |
| | 3 | 6BA6 | 550KΩ | 0Ω | .1Ω | 0Ω | 28KΩ | 60KΩ | 68Ω | - | - |
| | 4 | 6BE6 | 22KΩ | .7Ω | .1Ω | 0Ω | 20KΩ | 40KΩ | 1 Meg. | - | - |
| ‡ | 5 | 6BA6 | 550KΩ | 0Ω | .1Ω | 0Ω | 22KΩ | 60KΩ | 47Ω | - | - |
| | 6 | 6BA6 | 550KΩ | 0Ω | .1Ω | 0Ω | 22KΩ | 60KΩ | 68Ω | - | - |
| ‡ | 7 | 6AU6 | 100KΩ | 0Ω | .1Ω | 0Ω | 120KΩ | 15KΩ | 0Ω | - | - |
| | 8 | 6S8GT | 300KΩ | 0Ω | 175KΩ | 175KΩ | 200KΩ | 240KΩ | .1Ω | 0Ω | 10 Meg. |
| | 9 | 6V6GT | 0Ω | 0Ω | 20KΩ | 20KΩ | 470KΩ | INF. | .1Ω | 270Ω | - |
| | 10 | 5Y3GT | INF. | 20KΩ | INF. | 90Ω | INF. | 85Ω | INF. | 20KΩ | - |

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

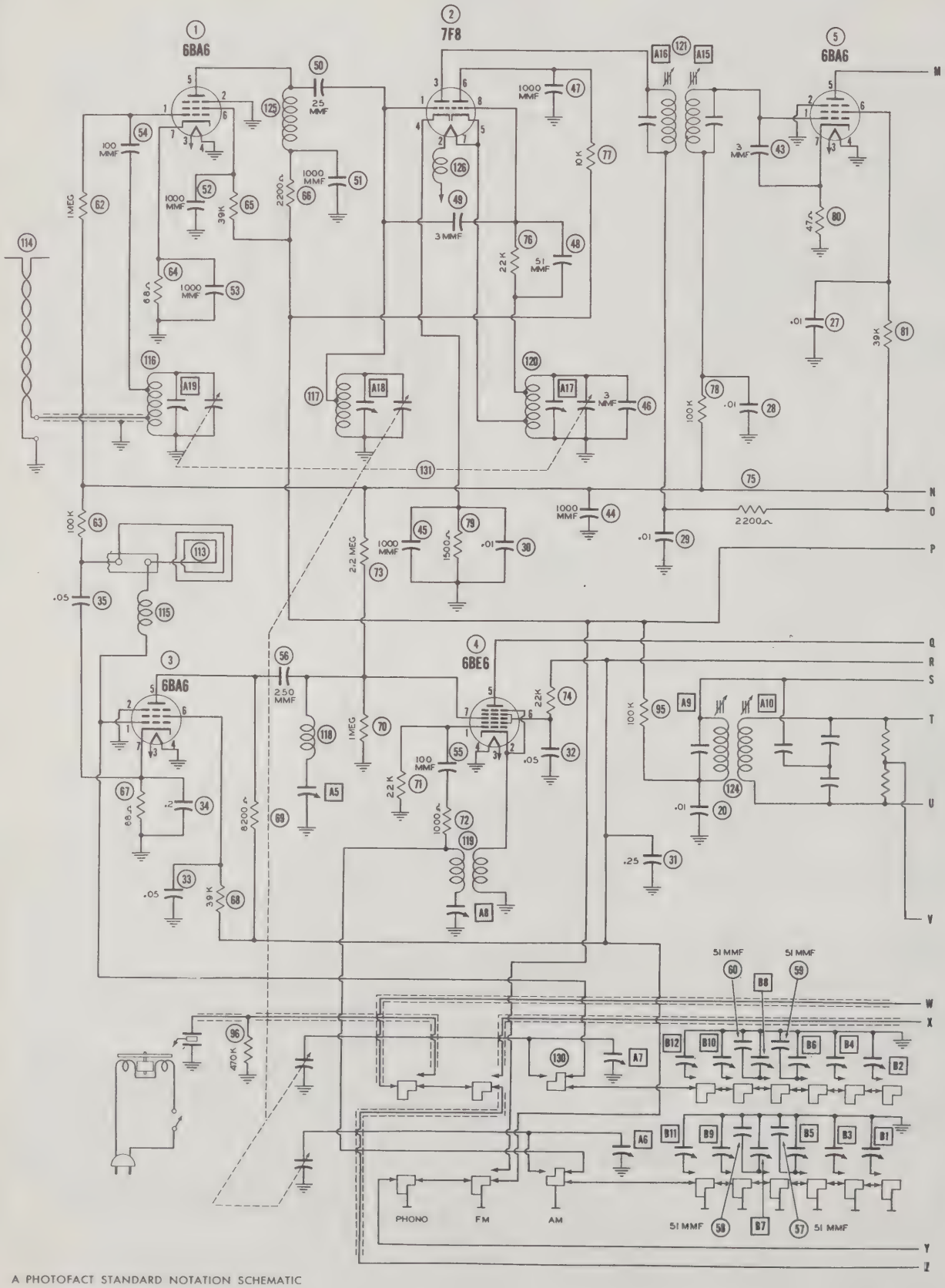
STAGE GAIN MEASUREMENTS

| | | | | | |
|---|---|---|---|---|---|
| RF GRID TO CONV. GRID | 15X | 600KC | IF TUBE | 140X | 455KC |
| CONV. GAIN | 6X | IN 600KC | 2nd IF TRANSFORMER | .6X | 455KC |
| | | OUT 455KC | AUDIO | 50X | 400∿ |
| 1st IF TRANSFORMER | .75X | 455KC | OUTPUT | 10X | 400∿ |

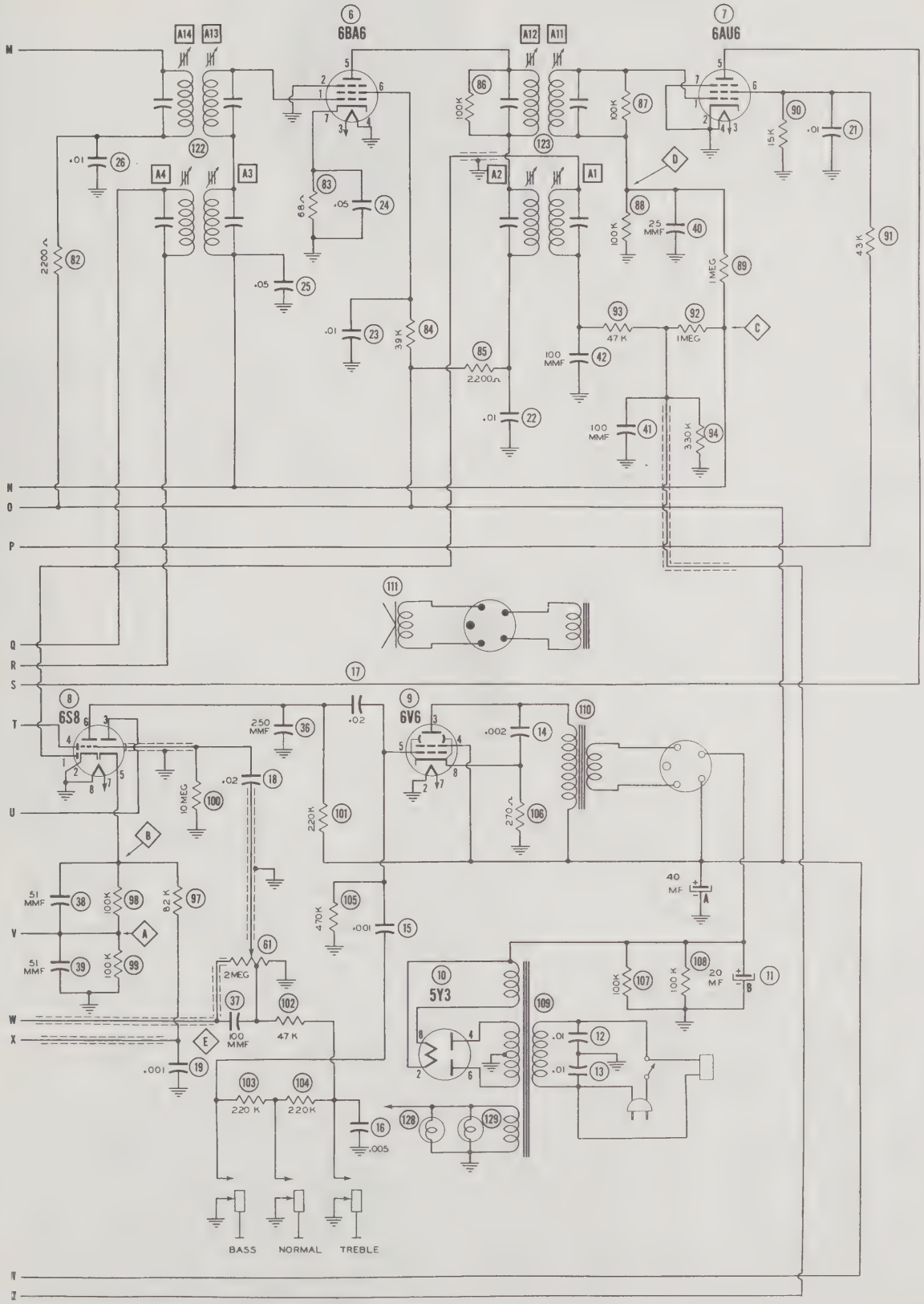
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.



DATE 9/48-#4816-22 SET #46-FOLDER #22




© Howard W. Sams & Co., Inc. 1948




A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1948

4816-22

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

AM IF adjustments should be made before any of the FM IF adjustments. After FM IF alignment is completed AM IF's should be rechecked.
Use insulated alignment screwdriver for all adjustments.

## AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | .2 MFD. | High side to rear stator of tuning cap. Low side to chassis. (Loop must be connected) | 455KC | BC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. |
| 2 | 250MMFD | High side to terminal #1. Low side to terminal #2 of loop ant. terminal strip. | " | " | Tuning cap. fully closed | " | A5 | Adjust for minimum output |
| 3 | 250MMFD | " | 1730KC | " | Tuning cap. fully open. | " | A6 | Adjust for maximum output |
| 4 | | Loop | 1400KC | " | Tune for maximum output. | " | A7 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 5 | | " | 600KC | " | " | " | A8 | Rock tuning cap. and adjust for maximum output. Repeat Steps 3, 4 & 5 until no further improvement can be made. |

## FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Once FM IF Alignment is completed recheck AM IF Alignment.
In Step 7 tune sig. gen. above 10.7 for maximum reading and note meter reading and frequency at which this reading occurs. Tune sig. gen. below 10.7MC for maximum meter reading and note frequency and meter reading. One reading should not be less than 70% of the other. The difference between the center frequency and one peak should not exceed the difference between the center frequency and the other peak by more than 50KC.
In Step 8 attenuate sig. gen. for meter reading of 2 volts at 10.7MC. Tune sig. gen. above 10.7MC until meter reads 1 volt and note frequency at which this occurs. Tune sig. gen. below 10.7MC until meter reads 1 volt and note this frequency reading. The two freq. readings should be uniformly spaced either side of 10.7MC. The difference in KC between the two freq. readings should be at least 200KC.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6 | .002MFD | High side to Pin 1 (grid) 6AU6. Low side to chassis. | 10.7MC (400 ∿ Amp. Mod.) | FM | Tuning cap. fully open. | DC probe to Point A. Common to chassis | A9 | Adjust for maximum deflection. |
| 7 | .002MFD | " | " | " | " | DC probe to Point B. Common to chassis | A10 | Adjust for minimum audio output and zero deflection on VTVM. These should occur at same point. It may be necessary to repeat Step 6 to make these two occur simultaneously. Check band pass per prealignment notes. |
| 8 | .002MFD. | High side to Pin 1 (grid) 7F8. Low side to chassis. | " | " | " | DC probe to Point C. Common to chassis | A11,A12 A13,A14 A15,A16 | Adjust for maximum deflection. Attenuate output of sig. gen. to maintain maximum meter deflection of 2 volts. Check band pass per prealignment notes. Continue with FM RF Alignment. |

## FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal 60 ∿ modulation with 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.
When FM IF alignment is completed recheck AM IF adjustments.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6 | .01 MFD | High side to Pin 1 (grid) 6BA6 1st IF Tube (5). Low side to chassis. | 10.7MC (Freq. Mod.) | FM | Tuning cap. fully open. | Vertical input to Point D. Ground to chassis. | A11,A12 A13,A14 | Adjust for maximum amplitude, symmetry & coincidence of pattern per Fig. 1. |
| 7 | .01 MFD | High side to Pin 1 (grid) 7F8. Low side to chassis. | " | " | " | " | A15,A16 | " |
| 8 | .01 MFD | " | " | " | " | Vertical input to Point E. Ground to chassis. | A9,A10 | Alternately adjust A9 for maximum amplitude & A10 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Continue with FM RF Alignment. |

## AM ALIGNMENT

Turn tuning cap. fully closed and mark position of pointer. This is the index mark referred to in Step 9 below.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9 | 300Ω carbon res. | High side to FM Ant. terminal. Low side to chassis. | 108MC (Unmodulated) | FM | 6-17/32" from index mark. | DC probe Point C. Common to chassis. | A17 | Adjust for maximum deflection. |
| 10 | " | " | 104MC | " | Tune for maximum deflection. | " | A18,A19 | Rock tuning cap. and adjust for maximum deflection. |

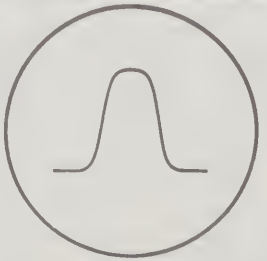


FIG. 1

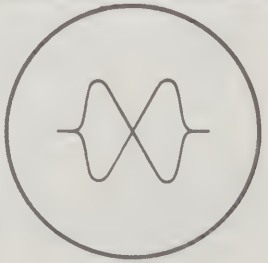


FIG. 2

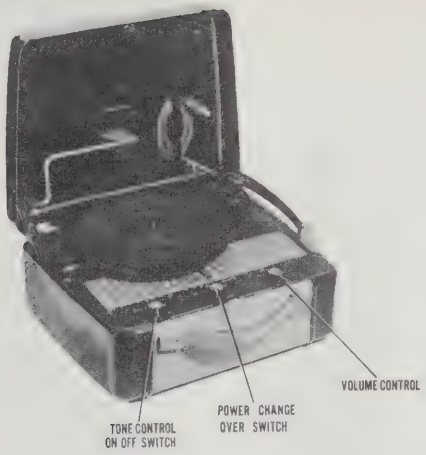
## PUSHBUTTON ADJUSTMENTS

Ranges of buttons from left to right are: 540-900KC, 540-900KC, 750-1320KC, 750-1320KC, 750-1320KC and 1000-1500KC.

Make up a list of stations to be set up ranging from low to high frequency making certain that each station falls within range of its button.

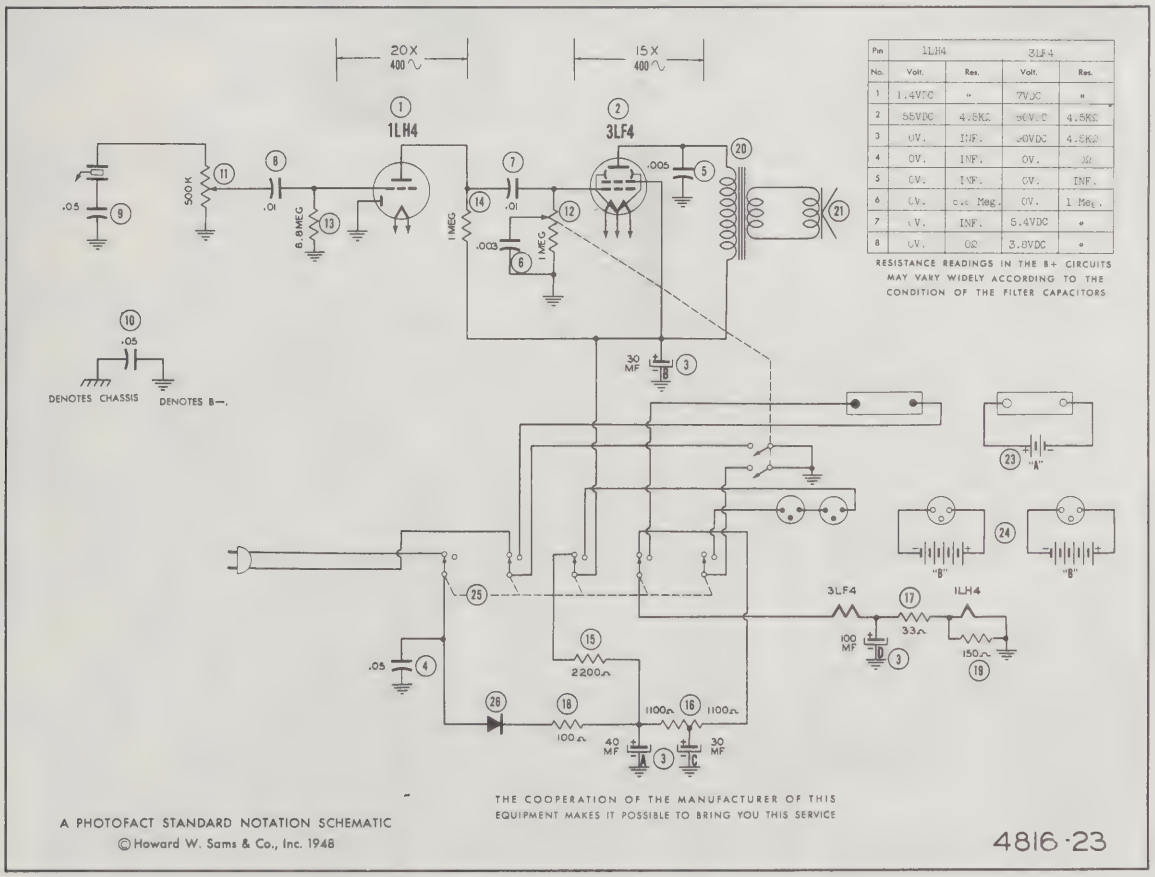
1. Turn set on and allow to warm up for at least 15 minutes.
2. Push in first button on left and adjust B1 to tune in station. Adjust B2 for maximum volume.
3. Check accuracy of setting by switching to AM and manually tuning in station.
4. To set up remaining buttons follow the same procedure as outlined above.

SILVERTONE MODEL 8168
(Ch. 109.638) BATTERY-LINE OPERATED




SILVERTONE MODEL 8168

| | |
|---|---|
| **TRADE NAME** | Silvertone, Model 8168 (Ch. 109.638) |
| **SUPPLIER** | Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill. |
| **TYPE SET** | Three Power Operated Portable Phono Player with Two Tube Amplifier |
| **TUBES** (TWO) | Types, 1LH4 AF Amp., 3LF4 Power Output |
| POWER SUPPLY | 110-120 Volts AC-DC or 6 Volt "A" Supply and 90 Volt "B" Supply |
| RATING | .13 Amp. @ 117 Volts AC or 42 MA @ 6 Volts DC and 11.5MA @ 90 Volts DC |




| Pin No. | 1LH4 Volt. | 1LH4 Res. | 3LF4 Volt. | 3LF4 Res. |
|---|---|---|---|---|
| 1 | 1.4VDC | " | 7VDC | " |
| 2 | 55VDC | 4.5KΩ | 90VDC | 4.5KΩ |
| 3 | 0V. | INF. | 90VDC | 4.5KΩ |
| 4 | 0V. | INF. | 0V. | 0Ω |
| 5 | 0V. | INF. | 0V. | INF. |
| 6 | 0V. | 0.6 Meg. | 0V. | 1 Meg. |
| 7 | 0V. | INF. | 5.4VDC | " |
| 8 | 0V. | 0Ω | 3.8VDC | " |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at minimum, no signal applied for voltage measurements.

**HOWARD W. SAMS & CO., INC.** **Indianapolis , Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: SILVERTONE PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | AF Amp. | 1LH4 | 1LH4 | 5AG | |
| 2 | Power Output | 3LF4 | 3LF4 | 6BB | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 3A | 40 | 150 | DA55493 | AF888D | UP7DJ63 | DY-419 | EL-443 | ● Filter |
| B | 30 | 150 | | | | | | ■ " |
| C | 30 | 150 | | | | | | ▲ " |
| D | 100 | 15 | | PRS25/100 | | M-100-15 | UHC-115 | Filament Bypass |
| 4 | .05 | 400 | | 484-05 | DT4S5 | MPH-4-05 | TC-15 | Line Filter |
| 5 | .005 | 600 | | 684-005 | DT6D5 | ST-6-005 | TC-25 | Output Plate Bypass |
| 6 | .003 | 600 | | 684-003 | DT6D3 | ST-6-003 | TC-23 | Tone Comp. |
| 7 | .01 | 400 | | 484-01 | DT4S1 | ST-4-01 | TC-11 | Audio Coupling |
| 8 | .01 | 400 | | 484-01 | DT4S1 | ST-4-01 | TC-11 | " " |
| 9 | .05 | 400 | | 484-05 | DT4S5 | ST-4-05 | TC-15 | Phono Isolation |
| 10 | .05 | 400 | | 484-05 | DT4S5 | ST-4-05 | 72P1 | Line Isolation |

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SILVERTONE PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 11A | 500KΩ | ½ | DB55553-3 | D13-133 | AM-60-Z | Volume Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 11A per instructions |
| 12A | 1 Meg. | ½ | DB56567-1 | D13-137 | AM-63-Z | Tone Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 12A per instructions |
| C | Switch | | " " | 42 | SW-A2 | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SILVERTONE PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 13 | 6.8 Meg. | ½ | | BTS-6.8 Meg. | Blue-Gray-Grn. AF Grid |
| 14 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. AF Plate |
| 15 | 2200Ω | ½ | | BTS-2200 | Red-Red-Red Filter |
| 16A | 1100Ω | 6 | DB55512-1 | ABA-2250 | Filament Dropping |
| B | 1100Ω | 6 | | | " " |
| 17 | 33Ω | ½ | | BW-½-33 | Or.-Or.-Blk. Series Filament |
| 18 | 100Ω | 2 | DB55511-1 | BW-2-100 | Br.-Blk.-Br. Surge Limiter |
| 19 | 150Ω | ½ | | BW-½-150 | Br.-Grn.-Br. Filament Shunt |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: SILVERTONE PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 8000Ω | 3.3Ω | 750Ω | .6Ω | DC-60260-1 | A-3850 | T22847 | A-2800 | |

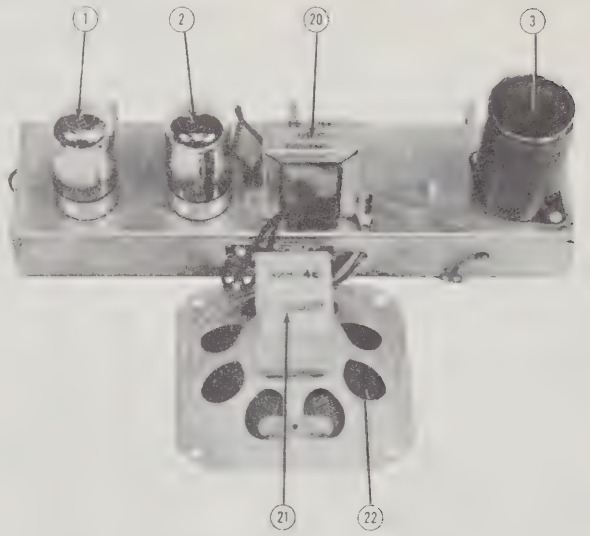
## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: SILVERTONE PART No. | JENSEN PART No. | QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 21 | FIELD PM | VC IMP. 3.3Ω | DD56029 | ST-113* Mod. P4-X | 4A15* | *Drill new mounting holes. |
| 22 | CONE DIA. 4" | VC DIA. 1/2" | | | | |

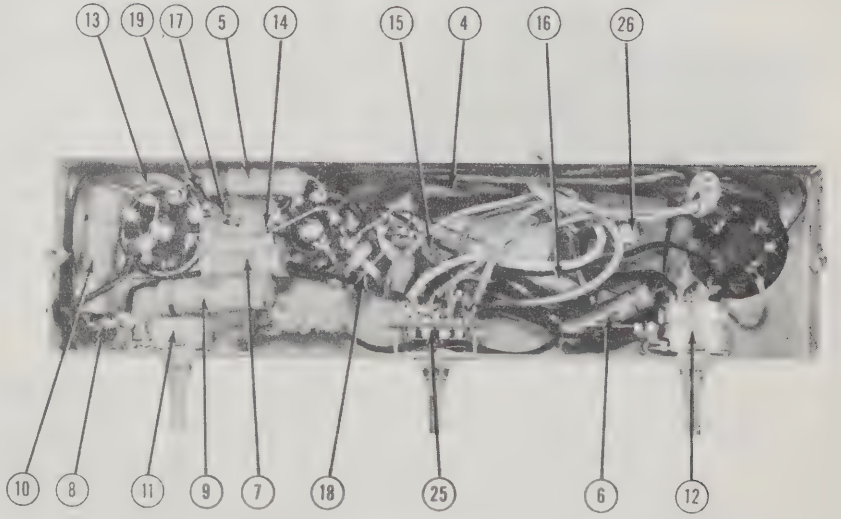
## BATTERIES

| ITEM No. | VOLTAGE | SILVERTONE PART No. | REPLACEMENT DATA: EVEREADY "A" | EVEREADY "B" | EVEREADY "A-B" | BURGESS "A" | BURGESS "B" | BURGESS "A-B" | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 23 | 6V "A" | 6451 | 744 | | | F4P1 | | | |
| 24 | 90V "B" | 6461 | | 482 | | | M30 | | 2 Used in series. |

## CHASSIS—TOP VIEW



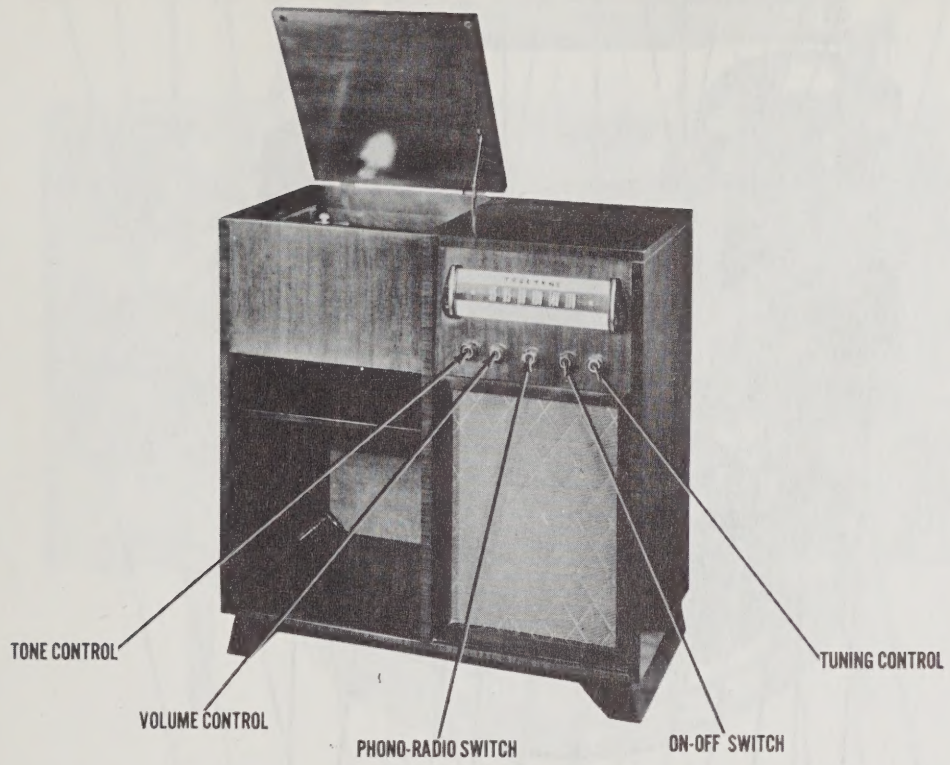

## CHASSIS—BOTTOM VIEW




## MISCELLANEOUS

| ITEM No. | PART NAME | SILVERTONE PART No. | NOTES |
|---|---|---|---|
| 25 | Switch | DB55504-1 | AC/DC-Batt. |
| 26 | Rectifier | DA60256 | Selenium |
| | Knob | DC59614-1 | |

TRUETONE MODEL D1840
(Fact. #138PCXM)




TRUETONE MODEL D1840
(Fact. #138PCXM)

| | |
|---|---|
| **TRADE NAME** | Truetone, Model D1840 (Fact. #138PCXM) |
| **SUPPLIER** | Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo. |
| **TYPE SET** | AC Operated Combination Phono-Radio, Superheterodyne Receiver with Loop Antenna |
| **TUBES** (SIX) | Types, 6SK7 RF Amp., 6SA7GT Converter, 6SK7 IF Amp., 6SQ7GT Det.-AVC-AF, 6K6GT Power Output, 5Y3GT Rectifier. |
| **POWER SUPPLY** | 110-120 Volts AC |
| **TUNING RANGE—BROADCAST** | 535-1725KC RATING .44 Amp. @ 117 Volts AC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1 MFD. | High side to front stator of tuning cap. Low side to chassis. | 455KC | Tuning cap. fully open. | Across voice coil | A1,A2, A3,A4 | Adjust for maximum output. |
| 2 | 250MMFD. | High side to ext. antenna terminal. (With link connected for ant. operation). Low side to chassis. | 1725KC | " | " | A5 | " " " " |
| 3 | 250MMFD. | " | 1500KC | Tune for maximum output. | " | A6,A7 | " " " " |

DISASSEMBLY INSTRUCTIONS

1. Remove five push-on type control knobs.
2. Remove the wood screws holding loop antenna to rear of cabinet.
3. Remove loop leads from loop antenna. Remove loop from cabinet.
4. Disconnect speaker leads.
5. Disconnect phono-motor leads.
6. Disconnect phono-pickup leads.
7. The dial pointer must be removed from the pointer rail assembly and cabinet before the chassis can be taken from the cabinet. This can be done by detaching the dial cord from the pointer and sliding the pointer to the right (viewed from the rear of the cabinet) as far as it will go. The dial pointer can now be removed from the cabinet.
8. Remove four hex head machine screws holding chassis in cabinet. Remove chassis from cabinet.
9. Remove four hex nuts holding speaker in cabinet. Remove speaker from cabinet.

**HOWARD W. SAMS & CO., INC. • • Indianapolis , Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

# PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D1840

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| | | TRUETONE PART No. | STANDARD REPLACEMENT | | |
| 1 | RF Amp. | 6SK7 | 6SK7 | 8N | |
| 2 | Converter | 6SA7GT | 6SA7GT | 8AD | |
| 3 | IF Amp. | 6SK7 | 6SK7 | 8N | |
| 4 | Det.-AVC-AF | 6SQ7GT | 6SQ7GT | 8Q | |
| 5 | Power Output | 6K6GT | 6K6GT | 7S | |
| 6 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TRUETONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | SOLAR PART No. | SPRAGUE PART No. | |
| 7 | 16 | 450 | A18-274 | PRS450/16 | BR1645 | M-16-450 | UT16 | Filter |
| 8 | 16 | 450 | A18-279 | PRS450/16 | BR1645 | M-16-450 | UT16 | " |
| 9 | .01 | 1000 | A16-168 | 1084-01 | MD16S1 | STM-10-01 | TR-11 | Output Plate Bypass |
| 10 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Audio Coupling |
| 11 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Tone Comp. |
| 12 | .01 | 400 | A16-156 | 484-01 | DT4S1 | ST-4-01 | TC-11 | Audio Coupling |
| 13 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | AF Plate Decoup. |
| 14 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | IF Screen Bypass |
| 15 | .05 | 200 | A16-152 | 484-05 | DT2S5 | ST-4-05 | TC-15 | IF Cathode Bypass |
| 16 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | Mixer Screen Bypass |
| 17 | .05 | 200 | A16-152 | 484-05 | DT2S5 | ST-4-05 | TC-15 | AVC Filter |
| 18 | .05 | 200 | A16-152 | 484-05 | DT2S5 | ST-4-05 | TC-15 | " " |
| 19 | .05 | 400 | A16-158 | 484-05 | DT4S5 | ST-4-05 | TC-15 | RF Screen Bypass |
| 20 | .05 | 200 | A16-152 | 484-05 | DT2S5 | ST-4-05 | TC-15 | RF Cathode Bypass |
| 21 | 250 | 500 | A15-176 | 1468-00025 | 5W5T25 | MO.5-325 | 1FM-325 | AF Plate Bypass |
| 22 | 50 | 500 | A15-175 | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Osc. Grid Cap. |
| 23 | 5 | 300 | A83-355 | 1468-000005 | 5W5V5 | MO.5-55 | 1FM-55 | RF Coupling-Cer. |
| 24 | 50 | 500 | A15-175 | 1469-00005 | 5R5Q5 | MOS.5-45 | MS-45 | Fixed Trimmer |
| 25 | 200 | 500 | B15-189 | 1469-0002 | 5R5T2 | MOS.5-32 | MS-32 | " " |
| 26 | 5 | 300 | A83-355 | 1468-000005 | 5W5V5 | MO.5-55 | 1FM-55 | Ant. Coupling-Cer. |

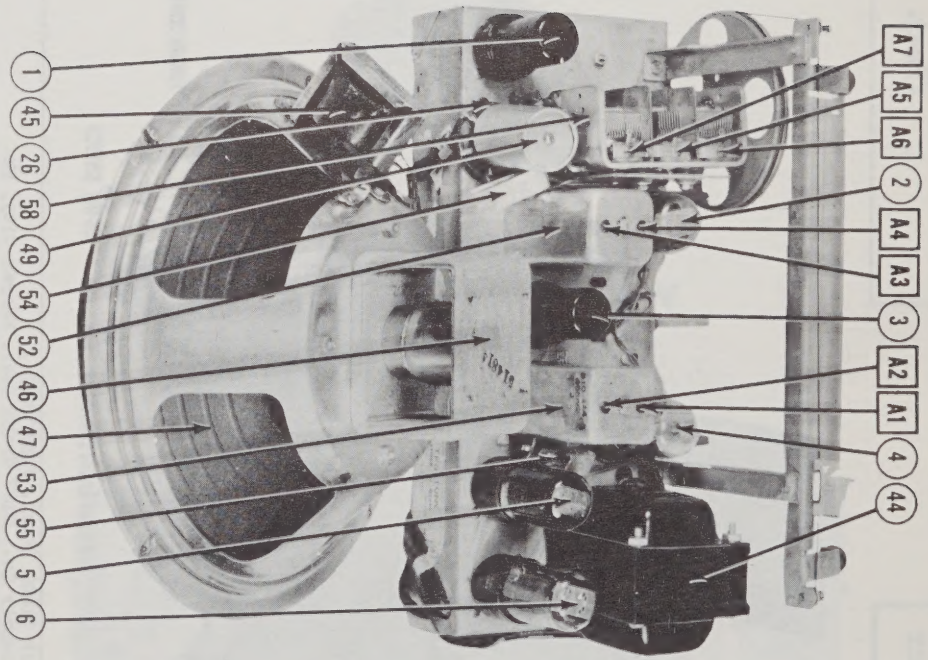
## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | TRUETONE PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 27A | 500KΩ | ½ | A24-169 | D13-133 | AM-60-Z | Volume Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 27A per instructions |
| 28A | 3 Meg. | ½ | A26-123 | D13-140 | AM-67-Z | Tone Control |
| B | Shaft | | Not Req. | E | KSS-3 | Attach to 28A per instructions |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | TRUETONE PART No. | IRC PART No. | |
| 29 | 220KΩ | ½ | A60-667 | BTS-220K | Red-Red-Yl. AVC Network |
| 30 | 150Ω | ½ | A60-686 | BW-½-150 | Br.-Grn.-Br. RF Cathode |
| 31 | 100KΩ | ½ | A60-671 | BTS-100K | Br.-Blk.-Yl. RF Screen |
| 32 | 27KΩ | 1 | A60-692 | BTA-27K | Red-Vi.-Or. Mixer Screen |
| 33 | 22KΩ | ½ | A60-659 | BTS-22K | Red-Red-Or. Osc. Grid |
| 34 | 150Ω | ½ | A60-686 | BW-½-150 | Br.-Grn.-Br. IF Cathode |
| 35 | 100KΩ | ½ | A60-671 | BTS-100K | Br.-Blk.-Yl. IF Screen |
| 36 | 10 Meg. | ½ | A60-663 | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 37 | 220KΩ | ½ | A60-667 | BTS-220K | Red-Red-Yl. AF Plate Load |
| 38 | 200KΩ | ½ | A60-667 | BTS-220K | Red-Red-Yl. AF Plate Decoup. |
| 39 | 470KΩ | ½ | A60-662 | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 40 | 560Ω | 1 | A60-701 | BTA-560 | Grn.-Blue-Br. Output Cathode |
| 41 | 220KΩ | ½ | A60-667 | BTS-220K | Red-Red-Yl. Series Phono |
| 42 | 1000Ω | 2 | A60-699 | BT-2-1000 | Br.-Blk.-Red Filter |
| 43 | 82KΩ | 1 | A60-700 | BTA-82K | Gray-Red-Or. Bias |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | TRUETONE PART No. | STANCOR PART No. | THORDARSON PART No. | MERIT PART No. |
| 44 | 117V AC @ .44A | 580V CT @ .056A DC | 5.1V AC @ 2.0A | 6.4V AC 1.95A | C80-223 | P-6119* | T22R02 | P-3160# |

#Drill new mounting holes and add series resistor to reduce plate voltage.
*Mount vertically with universal mounting brackets.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | TRUETONE PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 45 | 6900Ω | 3.4Ω | 390Ω | .6Ω | A80-222 | A-3823 | T22S47† | A-2901 | †Drill new mounting holes. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | TRUETONE PART No. | JENSEN PART No. | QUAM PART No. | |
| | FIELD | VC IMP. | | ST-119‡ | | ‡Replace output transformer to match 6-8Ω voice coil. |
| 46 | PM | 3.4Ω | B79-359 | Mod. P10-T | 10A31 | |
| | CONE DIA. | VC DIA. | | | | |
| 47 | 9-3/4" | 1" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | TRUETONE PART No. | MEISSNER PART No. | |
| 48 | Loop Ant. | 0Ω | | S84-204 | | |
| 49 | Ant. Coil | 58Ω | 3.5Ω | C10-459 | | Resistance for primary of loop is .8Ω. |
| 50 | RF Coil | 65Ω | 3.0Ω | B10-452 | | |
| 51 | Osc. Coil | | 7.8Ω | B10-446 | | |
| 52 | Input IF | 20Ω | 20Ω | B10-412 | 16-5712 | |
| 53 | Output IF | 18Ω | | B10-444 | 16-6670 | |

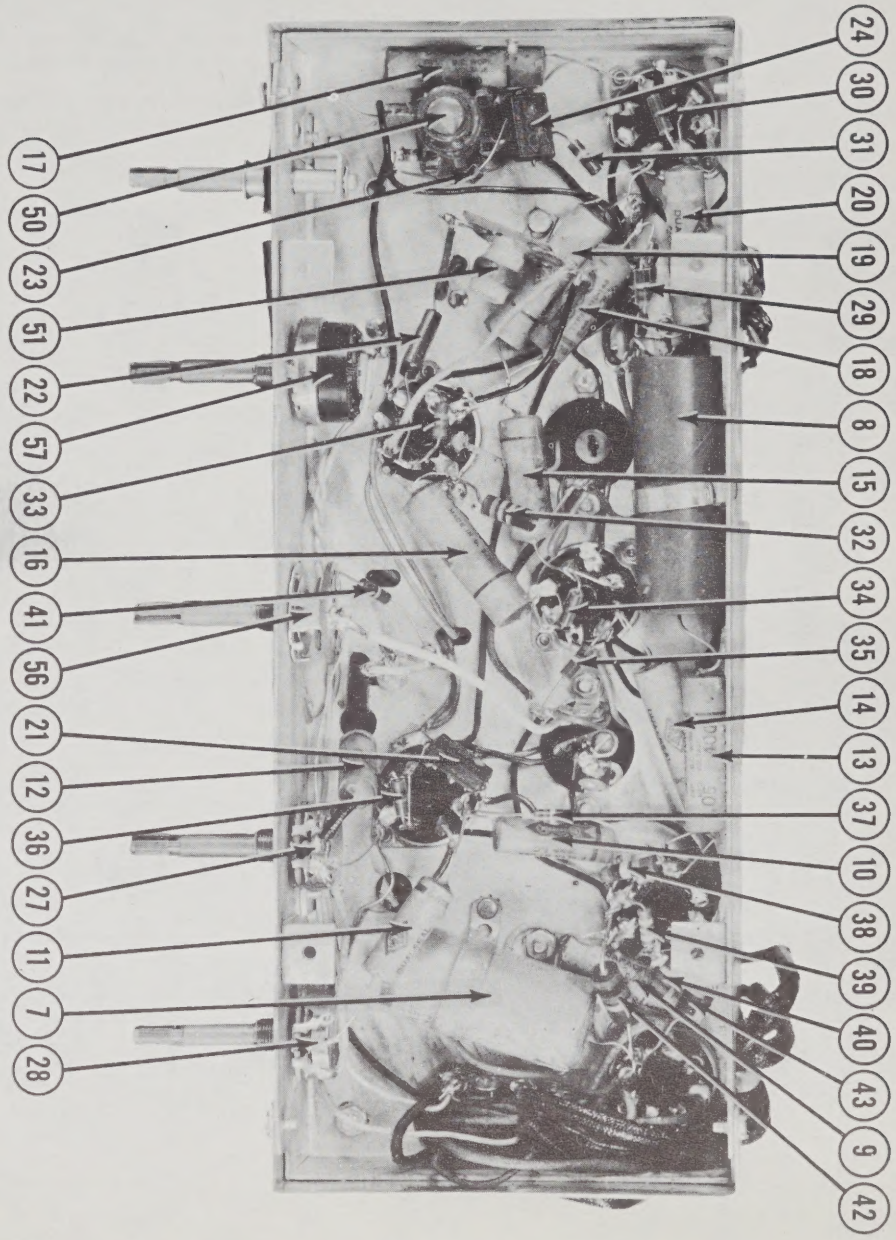
## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | TRUETONE PART No. | | |
| 54 | Bayonet | 6-8 | 0.25 | Blue | | | Type 44 |
| 55 | " | 6-8 | 0.15 | Brown | | | Type 47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | TRUETONE PART No. | NOTES |
|---|---|---|---|
| 56 | Switch | A69-180 | Radio-Phono |
| 57 | " | A69-169 | On-Off |
| 58 | 3 Gang Var. Cap. | B19-186 | (16-452MMF, 25-192MMF, 19-447MMF) |
| | Dial Scale | C67-520 | |
| | Dial Pointer | B58-70 | |

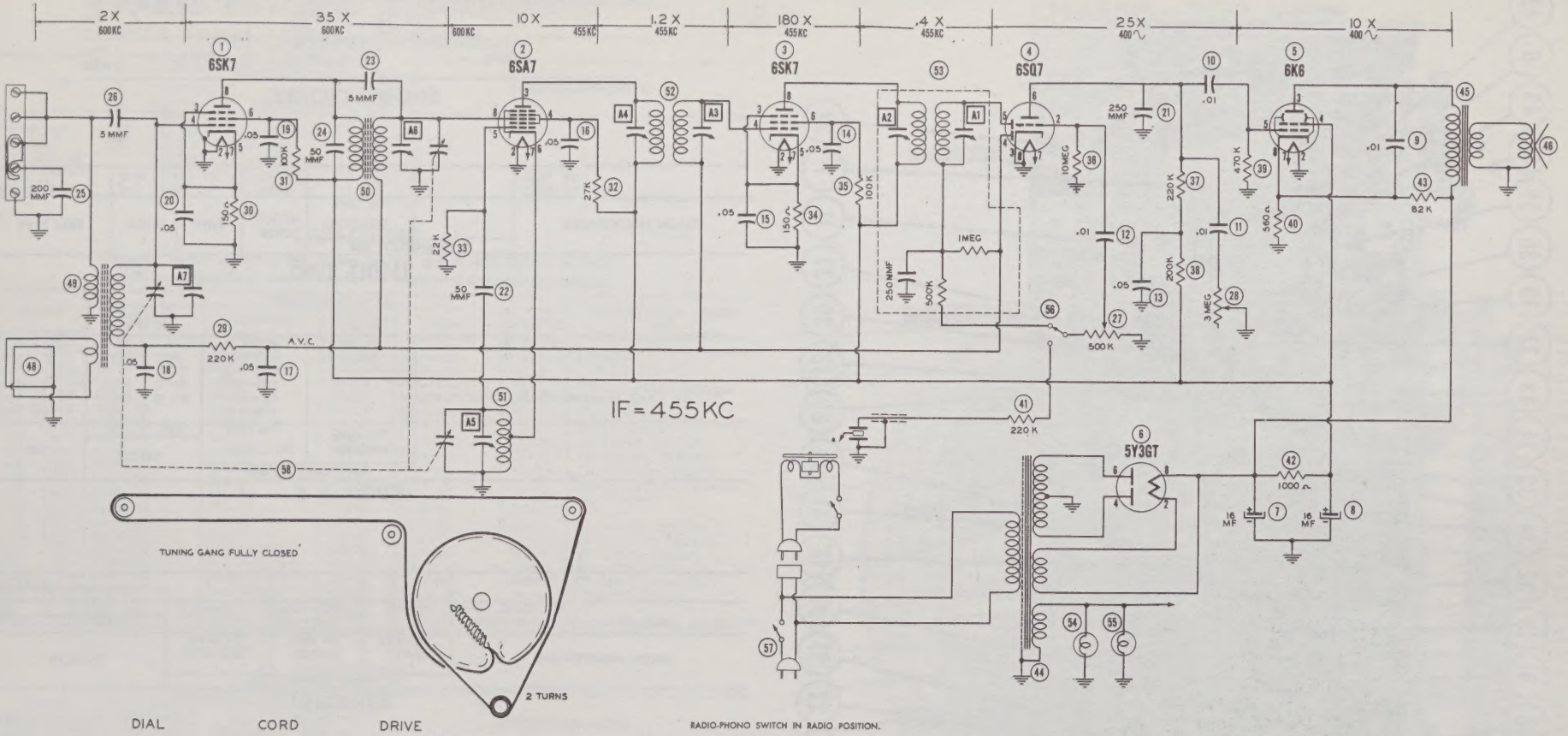
# CHASSIS—BOTTOM VIEW




DATE 9/48-#4816-24 SET #46-FOLDER #24

TRUETONE MODEL D1840

TRUETONE MODEL D1840




RADIO-PHONO SWITCH IN RADIO POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SK7 | 0V. | 0V. | 1VDC | -.2VDC | 1VDC | 75VDC | 6.4VAC | 260VDC |
| 2 | 6SA7GT | 0V. | 0V. | 260VDC | 65VDC | -8.4VDC§ | 0V. | 6.4VAC | -.3VDC |
| 3 | 6SK7 | 0V. | 0V. | 1.2VDC | -.3VDC | 1.2VDC | 80VDC | 6.4VAC | 260VDC |
| 4 | 6SQ7GT | 0V. | -.6VDC | 0V. | -.3VDC | -.6VDC | 100VDC | 6.4VAC | 0V. |
| 5 | 6K6GT | 0V. | 0V. | 250VDC | 255VDC | 0V. | 180VDC | 6.4VAC | 17VDC |
| 6 | 5Y3GT | 0V. | 310VDC | 0V. | 210VAC | 0V. | 290VAC | 0V. | 310VDC |

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SK7 | 0Ω | 0Ω | 33KΩ | 1.8 Meg. | 33KΩ | 100KΩ | .1Ω | 6KΩ |
| 2 | 6SA7GT | 0Ω | 0Ω | 6KΩ | 32KΩ | 22KΩ | .5Ω | .1Ω | 1.5 Meg. |
| 3 | 6SK7 | 0Ω | 0Ω | 150Ω | 1.5 Meg. | 150Ω | 100KΩ | .1Ω | 6KΩ |
| 4 | 6SQ7GT | 0Ω | 10 Meg. | 0Ω | 550KΩ | 1.5 Meg. | 450KΩ | .1Ω | 0Ω |
| 5 | 6K6GT | 0Ω | 0Ω | 5KΩ | 6KΩ | 470KΩ | 260KΩ | .1Ω | 560Ω |
| 6 | 5Y3GT | INF. | 5KΩ | INF. | 255Ω | INF. | 245Ω | INF. | 5KΩ |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1948

4816-24

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.